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UNITED STATES DEPARTMENT OF AGRICULTURE  
**DEPARTMENTAL CIRCULAR**

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*THE DEPARTMENTAL CIRCULAR is issued as a convenient means of intercommunication of official information among the personnel of the Department of Agriculture. Its circulation, therefore, will be limited to those having official connection with the department. Its editorial policy will be determined wholly by the specific class of*

*readers for whom it is published and, therefore, may depart somewhat from the editorial policy governing material issued for the public. While the material to be published will by no means be confidential, the department can not extend the circulation of this publication beyond its own employees and official collaborators.*

**WORK—AND SERVICE.**

There are two ways of looking at a position in the Department of Agriculture. One way is to look at it as a job; the other, to look upon it as an opportunity for public service. The member of the personnel who sees it in the latter light is the one who gets the maximum of satisfaction out of his work. It goes without saying that he is also the one from whom the Government, as a rule, gets the maximum of service and who is most likely to find himself in line for promotion when occasion arises.

To get this more desirable viewpoint the employee must have an adequate conception of what the activities of the department mean to the country at large and of what they promise for its future. He must come to realize to the full the significance of the social and economic functions of the department. He must come to feel himself as a coworker in a great organization maintained by the people for noble ends and to feel it a privilege to use his best endeavor to further those ends. There are certain unpleasant factors, such as the impersonality and inelasticity which seem to be inherent in the organization of large enterprises, which tend to detract from the satisfaction to be derived from the service, but these inevitable annoyances fall with the least weight upon the employee who takes the positive attitude toward his work—who finds it worth doing for itself as well as for the salary it brings him.

It is true that it is sometimes difficult for the members of the clerical force in Washington to acquire the interest and enthusiasm for the work which come naturally to those who are in the field and thus in

position to get the flavor of the actual constructive work and the inspiration that comes from grappling first-hand with the problems before the department. But it is possible even for those whose work is of the most mechanical character to get the spirit of the service and to make the work a constructive effort rather than the perfunctory performance of a set task. A little attention to the progress of the work of the department as a whole and a more detailed study of the work of his immediate bureau or office should serve to give the average employee a stimulating sense of personal importance to the Government as a coworker in its vast and beneficent enterprises.

This spirit of public service is one that should be fostered in every possible way, and it is to this end, in part, that the Departmental Circular has been established and the circulation of the Weekly News Letter enlarged to embrace the entire personnel. It is hoped that the outlines of the activities of the department set forth in these periodicals from time to time will help to intensify the interest of the personnel in the work and thus entail the increase in efficiency which must follow any increase in interest which puts the worker in more vital touch with his task.

Members of the personnel are urged to cooperate with the Office of Information to the end that the Circular and the News Letter may accurately reflect the activities and spirit of the department at all times; for unless this is done they will fail to fulfill their mission as organs of the department.

*Carl E. Brown*

*Assistant Secretary.*



## IMPORTANT RULINGS.

### COMPTROLLER'S DECISIONS.

(Contribution from the Office of the Secretary.)

In recent correspondence with the Secretary of Agriculture the following principles have been enunciated by the Comptroller of the Treasury:

The construction of a vault of considerable size, built of reinforced concrete, stone, and other materials that go to make up a substantial building, at a considerable distance from another building and not attached thereto or connected therewith except by a pipe line connecting apparatus in the vault with apparatus in the main building, is not an improvement of the main building nor a part of the equipment thereof, but is a permanent public building in itself and must therefore be specifically authorized by law. (Dec. dated May 4, 1915.)

Articles of equipment which have served the purpose for which they were originally purchased and are no longer needed by the purchasing bureau may be transferred by the Secretary to another bureau of the department without any adjustment of appropriations, provided such transfer devolves no expense upon and does not tend in any way to deplete the available appropriations of the bureau from which the articles are transferred. (Dec. dated May 7, 1915.)

In a subappropriation of the Bureau of Biological Survey of \$115,000 "for investigating the food habits of North American birds and mammals," the proviso "that of this sum \$15,000 shall be used for the destruction of ground squirrels on national forests" is in the nature of a direction rather than a limitation, and any portion of the balance of the \$115,000 is available for the object of the proviso, within the discretion of the Secretary, after taking into consideration the other objects to be accomplished by the subappropriation. (Dec. dated May 24, 1915.)

Persons enlisting in the United States naval reserve and accepting pay or compensation therein become officers or employees of the Government, and as such are not entitled at the same time to receive pay or compensation from the Department of Agriculture. (Dec. dated June 4, 1915.)

### SCIENTIFIC MEETINGS.

The department's policy regarding the attendance of scientists at meetings of scientific and related societies in which matters connected with their work are likely to be discussed is set forth in Memorandum No. 53. The time spent at such meetings will not be charged against annual leave, but the attending scientist must pay his own expenses.

### MEMORANDUM No. 53.

#### REGARDING ATTENDANCE UPON MEETINGS OF SCIENTIFIC AND RELATED SOCIETIES.

With a view to clearly defining procedure in the matter of attendance by employees of the department at meetings of scientific and related societies the following memorandum is submitted:

The department may from time to time desire to have a limited number of representatives attend such meetings, either to acquire information or to present facts of interest and value to the public. In such cases the department will officially designate the representatives, and their usual expenses for travel and subsistence will be paid.

It is recognized that the attendance of scientific workers at meetings of their associates is desirable, but it is believed that such attendance should be regarded more for the purpose of instruction and training of direct personal advantage to the employees. Employees should be encouraged to attend such meetings, and when attendance is recommended by the chief of the bureau concerned leave of absence with pay [not charged to annual leave] may be granted. All expenses, however, should be borne by the employee. Emphasis should be laid on the necessity for not permitting the work to be injured by overdepletion of the force at any one time.

Each case will need to be treated on its merits and receive the recommendation of the chief of bureau and the approval of the Secretary in advance.

B. T. GALLOWAY,  
Assistant Secretary.

DECEMBER 4, 1913.

### OUTSIDE PUBLICATION.

The question of writing for publications other than those of the Department of Agriculture frequently arises. The Department's policy on this point has been definitely expressed in Memorandum No. 103, which is as follows:

### MEMORANDUM No. 123.

#### PREPARATION OF MATERIAL FOR OUTSIDE PUBLICATION.

Officers and employees of the department are occasionally requested by publishers to prepare for publication books upon special subjects connected with the work of the department. In some cases these are specifically intended as textbooks for use in regularly constituted courses in agriculture in universities, colleges, or secondary schools, and most of them have in view the possibility of such use.

While it is the policy of the department to promptly disseminate through official channels the results of all important investiga-

tions made by the department, it is obvious that it is not possible through official channels of publications to make available to the public all of the accumulated information and experience of our investigators. It is believed that with proper safeguards department specialists can in some instances render important service to agriculture through the preparation and publication of textbooks upon appropriate subjects under conditions similar to those surrounding other scientific workers employed by and for the public, especially those connected with the State agricultural colleges and experiment stations.

It is clear that work of this character, if undertaken, should not be permitted to encroach upon the time, energy, and attention required by officers and employees for the effective prosecution of their departmental duties, whether in research, extension, or other work, and that inasmuch as the question of outside compensation to the author is either directly or indirectly involved, such work should only be undertaken after it has been thoroughly considered from the administrative standpoints and approved by the Secretary.

In order that the requisite consideration may be had in cases where officers or employees have in mind the preparation of textbooks or similar publications, an advisory committee on this subject is hereby designated, consisting of the Assistant Secretary, the Chief of the Bureau of Plant Industry, the Director of the Office of Experiment Stations, and the chairman of the editorial committee of the Journal of Agricultural Research. Proposals of this character should be submitted to the Assistant Secretary by the chiefs of the respective bureaus, with recommendations. In each case a definite outline of the contemplated publication should be furnished for consideration by the committee, which will examine and report thereon to the Secretary as a basis for his approval or disapproval.

The same procedure will govern the preparation of articles by officers or employees of the department on subjects relating to the work of the department which are intended for publication in outside journals or magazines, with this exception: Manuscripts of the articles themselves must be submitted to the Assistant Secretary, through the chiefs of bureaus. He will determine whether or not it is necessary to refer such manuscripts to the committee for consideration, and if such reference is not deemed necessary will at once approve or disapprove their publication. This procedure will be followed whether compensation is expected or otherwise.

This procedure, however, need not be observed in the case of articles on strictly agricultural subjects of a purely local character prepared by the demonstration or other local agents of the department for the infor-



mation and guidance of farmers in their respective districts and published in county or other papers of restricted distribution. The approval of such articles by the district or State supervising officer will be sufficient. Such officer should be careful, however, that nothing is published of a controversial nature or not strictly pertaining to the work under his charge.

Books or articles prepared or proposed to be prepared by officers or employees of the department on subjects not related to the work of the department are not contemplated in the foregoing, and the same rules will govern the granting of permission to do such work as for doing other kinds of outside work.

D. F. HOUSTON,  
*Secretary.*

SEPTEMBER 16, 1914.

The rules referred to in the last paragraph as governing outside work are laid down in Memorandum No. 104, which is as follows:

#### MEMORANDUM No. 104.

##### RELATIVE TO OUTSIDE WORK.

Attention is called to the following paragraph of the Administrative Regulations of the department:

"No officer or employee engaged continuously on work of the department shall perform or be engaged upon any work for private individuals, firms, companies, corporations, or institutions without the written consent of the Secretary, first had and obtained through the chief of the bureau, office, or division in which said officer or employee serves."

Permission to officers or employees of the department to engage in outside work will not be granted—

(1) If the outside work, or any of it, is to be performed during official hours.

(NOTE.—The practice of taking annual leave intermittently by hours or days in order to do outside work should be discouraged, the main purpose of annual leave thereby being defeated.)

(2) If the efficiency of the employee may be impaired by the performance of the outside duties, i. e., where the outside duties are of such an onerous or fatiguing nature as to injure the health of the employee or prevent him from doing his best work during official hours.

(3) If the work to be done in a private capacity may be construed by the public to be the official acts of the department.

(4) If the business connections to be established or the property interests to be acquired may result in a conflict between the private interests of the employee and his (or her) official duties, or tend to bias his (or her) judgment.

(5) If the doing of such work may involve the use of information secured as the result of employment in the department to the detriment of the public service.

(6) If such employment may tend to bring criticism upon the department or cause embarrassment.

The rules governing the preparation of textbooks and articles for journals or magazines are covered in Memorandum No. 103.

D. F. HOUSTON, *Secretary.*

SEPTEMBER 16, 1914.

#### NET WEIGHT DECISION.

The department has decided to extend until January 1, 1916, the privilege of using labels and cartons printed prior to May 11, 1914, which do not state the quantity of the contents of packages of food in terms of the largest unit, as Food Inspection Decision No. 154 holds that they should, providing the quantity of the contents is otherwise plainly and correctly indicated. For example, it is not proper, under Food Inspection Decision No. 154, to mark a package "Contents 26 fluid ounces"; the package should be marked "one and five-eighths pints" or "one pint 10 fluid ounces." The purpose of this decision is to compel quantities to be stated in the form most readily intelligible to most persons. In order to avoid the waste of a large number of labels and cartons, however, which had been printed before this decision was issued, the Department agreed some time ago to permit the use of such labels and cartons which, although they did not comply with the regulations in this respect, were otherwise satisfactory, had been printed prior to May 11, 1914, and indicated an honest attempt to comply with the provisions of the law. The present decision extends the time to which these labels may be used from June 1, 1915, to January 1, 1916, the additional time being granted for the purpose of enabling manufacturers and dealers in food products to dispose of their stocks of labels and to avoid the loss which the immediate enforcement of the regulations in this respect would cause. Until January 1, 1916, therefore, the department will not recommend proceedings solely upon the charge that the statement of quantity of contents on the package, if otherwise satisfactory, is not in terms of the largest unit in the package.

#### NURSERY STOCK IMPORTATION.

Section 1 of the plant quarantine act of August 20, 1912, provides:

"That nursery stock may be imported for experimental or scientific purposes by the Department of Agriculture upon such conditions and under such regulations as the said Secretary of Agriculture may prescribe."

In accordance with this provision the following regulations have been drawn up and are now in force:

#### IMPORTATION OF NURSERY STOCK NOT UNDER QUARANTINE.

REGULATION 1. *Definition.*—For the purposes of these regulations, the term "nursery stock" includes all plants, seeds, or other plant products for propagation.

REGULATION 2. Nursery stock, not under quarantine, may be imported by mail, express, freight, or other form of transportation, without permit or other compliance with the requirements of the act, when such plants are ordered by, or intended for, and are addressed to, the United States Department of Agriculture, Washington, D. C., the Federal Experiment Station, Honolulu, Hawaii, or the Federal Experiment Station, Mayaguez, Porto Rico.

REGULATION 3. Nursery stock imported by any official, employee, bureau, office, division, or board of the United States Department of Agriculture, including importations from Hawaii and Porto Rico, shall be addressed to, and entered through, the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry, except as to importations by the Federal experiment stations at Honolulu and Mayaguez, as provided for in regulation 7.

REGULATION 4. All such importations shall be inspected by an entomologist and a pathologist of the Federal Horticultural Board, who are authorized to treat, disinfect, and, if necessary, destroy such importations, and to hold under such quarantine as they shall deem necessary until the importations are certified by them as free from infestation. A record shall be kept by such inspectors of all plants found to be infested with insect pests or plant diseases, and of the treatment and ultimate disposition of such plants.

REGULATION 5. All nursery stock addressed to the Department of Agriculture, Washington, shall be delivered at the quarantine greenhouse or at the quarantine room of the Office of Foreign Seed and Plant Introduction for inspection and treatment, and shall not be removed therefrom until inspected and passed, or under such quarantine conditions as may be ordered by the inspectors of the Federal Horticultural Board: *Provided*, That infested portions of such plants may be taken, by permission of such inspectors, for scientific study by experts of the Department of Agriculture, due record being kept of the ultimate disposition of such samples. The packing material and original container, if so ordered, shall be burned.

REGULATION 6. All field propagating stations of the Bureau of Plant Industry, and all forest nurseries of the Forest Service, shall be inspected at least twice annually by inspectors of the Federal Horticultural Board, and no stock shall be shipped therefrom until pronounced by such inspectors free from insects and plant diseases. Such inspectors are also authorized to order the treatment or,



if necessary, the destruction of any plants or plant products for propagation found infested with insects or plant diseases.

REGULATION 7. Nursery stock may be imported by the Federal Experiment Station at Honolulu, Hawaii, in accordance with the regulations governing such importations of the Territorial government of Hawaii, and by the Federal Experiment Station at Mayaguez, P. R., in accordance with the regulations of the Board of Commissioners of Agriculture of Porto Rico.

The introduction into Guam of any nursery stock or other plant products for propagation will be permitted only through the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry, and only after inspection and certification by inspectors of the Federal Horticultural Board.

#### IMPORTATION OF NURSERY STOCK UNDER QUARANTINE.

Section 7 of the plant quarantine act was amended March 4, 1913, by the addition of the following proviso:

"Provided, That hereafter any class of nursery stock or of any other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products of which the importation may be forbidden from any country or locality under the provisions of section seven of the plant quarantine act approved August twentieth, nineteen hundred and twelve (Thirty-seventh Statutes, page three hundred and fifteen), may be imported for experimental or scientific purposes by the Department of Agriculture upon such conditions and under such regulations as the said Secretary of Agriculture may prescribe."

The following regulations shall govern departmental importations under this proviso:

REGULATION 1. All importations under this proviso of the act shall be made through the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry in accordance with the foregoing regulations governing importations of nursery stock not under quarantine, except that the importation of insects and their host plants for the purpose of breeding insect parasites may be made directly by the Bureau of Entomology.

REGULATION 2. No employee or other representative of the Department of Agriculture shall import any quarantined plant or plant product unless and until he has secured a permit therefor from the Federal Horticultural Board.

REGULATION 3. In the event of arrival of plants under quarantine from correspondents or explorers in foreign countries without permit, the Federal Horticultural Board shall be promptly notified by the official responsible for or receiving the importation, and the stock shall be held subject to inspection and treatment, as provided for above.

REGULATION 4. A record shall be kept by the Federal Horticultural Board of all de-

partmental importations of plants or plant products under quarantine, showing the condition and disposition made of the same and the official responsible for their importation and care.

Approved.

D. F. HOUSTON,  
Secretary of Agriculture.

MAY 31, 1913.

#### FORECASTS ON SCREENS.

As a popular means for the display of daily weather forecasts the screens of motion-picture shows were utilized at Birmingham, Ala., as long since as January, 1912.

Since that time their display in this manner has been extended to 15 cities and at 27 moving-picture theaters. Owing to the fact that these shows are not generally open until about 6 or 7 o'clock in the evening, after many persons have seen the weather forecasts in the afternoon papers or in the bulletins posted in public places, this system of display has not achieved general adoption. Wherever desired, however, the Weather Bureau will cooperate with the moving-picture shows by furnishing the forecasts for such presentation.

Of the several processes used, one consists in printing the forecasts on celluloid films from which the emulsion has been removed. Waste films answer the purpose, and are obtained from photographic establishments where films are developed for amateurs. The films are placed over night in a solution of lye or caustic soda in order to remove the emulsion. The impression takes nicely, but does not dry readily, and it is, therefore, necessary to place the film between glass plates. These are obtained from the theaters where large quantities are on hand. A mask is cut from a forecast card or paper of the same thickness and placed on the wet side of the film to prevent smearing. The whole is bound together with bits of gummed paper, and can be prepared in a few minutes. It is found that if the milligraph ink is thinned with a small quantity of wood alcohol, about 2 to 4 ounces of alcohol to a 1-pound can of ink, the quality of the printing is greatly improved. It is important that the old stencils be left on the milligraph pad until the new ones are ready, as this prevents evaporation and the consequent clogging of the diaphragm.

#### The measurement of evaporation.—

Prof. B. E. Livingston contributes to the Monthly Weather Review for March a summary of efforts to measure accurately the evaporation from surfaces that in some way resemble plant surfaces. He also presents some of the needs of those undertaking evaporation studies, points out the defects of some past methods, and describes his now widely used porous-cup atmometers.

#### INSECT PESTS COLLECTED.

(Contribution from the Federal Horticultural Board.)

The annual loss due to insect pests in this country of farm products, including fruits and live stock, has reached enormous sums. A large percentage of this loss is due to the presence of imported insect pests, and much of it would have been eliminated if effective quarantine and inspection laws had been enacted at an earlier date and made it possible to prevent these pests from gaining a foothold in this country. The insects referred to below represent only the more important pests intercepted on imported stock in 1914.

Fifty-one nests of the brown-tail moth (*Euproctis chrysorrhæa* Linn.) have been collected on French nursery stock, and three egg masses of the gipsy moth (*Porthetria dispar* Linn.) on cedar and camellia from Japan, and a single egg mass on azalea from Belgium. The gipsy moth and brown-tail moth are already established in certain New England States, and upward of a million dollars are expended annually by these States in an effort to control these pests. In addition to this, the Federal Government also spends something over \$300,000 a year to aid in controlling these pests. Larvæ of the pink boll worm (*Gelechia gossypiella* Saunders) were found in three shipments of Egyptian cotton, one of which exhibited a 20 per cent infestation and was to be forwarded to the cotton region of Arizona. This insect has in recent years developed into a serious pest to Egyptian cotton and is now known to occur in India, Ceylon, Burma, Straits Settlements, Egypt, British East Africa, German East Africa, Nigeria, Sierra Leone, and the Hawaiian Islands.

The establishment of the pink boll worm in the States would doubtless result in an enormous loss to the cotton growers and manufacturers. Experiments are now well under way to determine the practicability of fumigating all imported cotton at the ports of entry.

A single living adult of the olive fruit fly (*Dacus oleæ* Rossi) was discovered in a small package of olive seed from Cape Town, South Africa, after having been en route for 28 days. In Italy it requires from 47 to 49 days for the pupa to transform to the adult, and it is possible, therefore, for this pest to enter the United States through eastern ports of entry and still have ample time to reach the olive-growing sections of California prior to the emergence of the adult. This fruit fly is recognized as one of, if not the most, injurious pests of the Mediterranean countries, and if established in the olive region of California would doubtless affect the output of this crop.

Avocado seed from Guatemala were infested with the larvæ of an undescribed cur-



culio (*Conotrachelus* sp.). The number of larvæ per seed varied from one to five, and the injury occasioned is not unlike that of the avocado weevil (*Heilipus lauri* Boh.). These seed were also infested with the broadnosed grain weevil (*Caulophilus latinasus* Say).

A single specimen of the banana root borer (*Sphenophorus sordidas* Germ.) was found in a banana plant held in quarantine from Brazil. When received, the plant was apparently healthy, but after remaining in quarantine for several months it commenced to die down, and on close examination the roots were found to be riddled by the larva mentioned. This insect is a serious pest to banana plantations in the Fiji Islands, and no variety seems immune from its attacks.

Egg masses of the European tussock, or vaperor, moth (*Notolophus antiqua* Linn.) have been frequently taken on various kinds of stock from Denmark, Holland, France, and Belgium. According to English writers, this insect is somewhat partial to civilized life, and frequents trees in densely populated cities, gardens, and parks. At times it is responsible for considerable damage to roses and to fruit and forest trees.

Cocoons of the oriental moth (*Cnidocampa flavescens* Walk.) were found on Japanese stock. This insect has an extensive distribution in the Orient, and has previously been introduced into and established in this country. Immediate steps were taken to control this insect, and it now appears to be well under control.

The citrus-leaf miner (*Phyllocnistis citrella* Stainton) has been detected on Citrus and Atalantia from the Philippine Islands. According to Mr. R. S. Woglum, in Bureau of Entomology Bulletin No. 120, this leaf miner is a serious pest in India, and is especially injurious to citrus nursery stock.

Puparia of the papaya fruit fly (*Toxotrypana curvicauda* Gerst.) were received in a package containing an unknown vine from Mexico. This material was retained, and subsequently adults were reared. The papaya fruit fly is now established in southern Florida and is reported to be very injurious to some varieties of this fruit.

Coccids have been reported frequently, some of the more important of which are the following:

*Aspidiotus destructor* (Sign.) on *Mangifera verticillata*, *M. indica* var. *carabao*, *Eugenia* sp. from the Philippine Islands, and coconut from American Samoa.

*Chionaspis wistariæ* (Cooley) on wistaria from Japan.

*Epidiopsis pircola* (Del Guer.) on pear seedlings from France.

*Morganella maskelli* (Ckll.) on citrus from Java and Brazil.

*Targionia bififormis* (Ckll.) on orchids from Venezuela and Colombia.

*Odonaspis secreta* (Ckll.) on bamboo from Japan.

*Odonaspis* sp. on grass from Brazil.

*Parlatoria* sp. on mango and citrus from Brazil.

*Pseudacnidia articulatus* (Morg.) on limoncillo from Ecuador and on cinnamon from Colombia.

*Pseudacnidia duplex* (Ckll.) on camellia, persimmon, and tea trees from Japan.

*Pseudacnidia pæoniæ* (Ckll.) on azalea, camellia, pear, gardenia, *Olea fragrans*, and andromedas from Japan.

*Pseudacnidia trilobitiformis* (Green) on *Jaboticaba murta* from Brazil and citrus from Japan.

*Pseudococcus ryani* (Coq.) on *Sciadopitys verticillata* from Japan.

*Pseudococcus calceolariae* (Mask.) on sugar cane from Brazil and flax from New Zealand.

The following list indicates by countries the number of species of insects collected on imported stock and reported to the Federal Horticultural Board by various State and Federal inspectors:

Algeria.....	3	Hawaii.....	1
Argentina.....	2	Holland.....	58
Australia.....	7	India.....	10
Belgian Congo.....	1	Ireland.....	1
Belgium.....	53	Italy.....	2
Bermuda.....	3	Japan.....	67
Bolivia.....	1	Java.....	9
Brazil.....	50	Kamerun.....	3
Canada.....	2	Korea.....	1
Canal Zone.....	3	Mexico.....	9
Cape Colony.....	2	New Zealand.....	14
Ceylon.....	1	Nigeria.....	11
China.....	13	Palestine.....	1
Colombia.....	37	Paraguay.....	1
Costa Rica.....	7	Peru.....	1
Cuba.....	2	Philippine Islands.....	24
Denmark.....	2	Reunion.....	1
Ecuador.....	4	Samoa.....	7
Egypt.....	6	Siam.....	3
England.....	22	Sudan (Africa).....	1
Formosa.....	2	Trinidad.....	4
France.....	35	Transvaal (South Africa).....	3
Germany.....	5	Turkey.....	1
Guatemala.....	13	Venezuela.....	3
British Guiana.....	1		

## THE BRANCH LIBRARY.

The organization of the library service of this department resembles the organization of the department as a whole; the trained cataloguers and classifiers of the main library are in general the research members of the library force; the branch librarians and their assistants are the demonstrators. The mission of the one body is to collect, to maintain, and to conserve; the mission of the other is to supply, to interpret, and to apply. The one is a clearing house and a reserve force, the other is the active, projecting, and interpreting agency.

The branch library, therefore, must be so managed that it will become of the greatest actual and daily use to the corps of workers for whose benefit it has been instituted. As a factor in focusing the attention of these workers upon the resources at their command, and as a factor in disseminating information, the bulletin board deserves attention. There are many employees whose individual work tends to absorb them and yet whose attention might well be called to

that which is being done elsewhere. The bulletin board will do this, and if the notices on the board be changed at stated intervals its study will readily become a profitable habit.

The material used on such a board will, in all probability, be very diverse. Selected weekly lists of interesting additions to the library should always be posted, together with copies of all memorandums from the Secretary and from the chief of the office. There also will be frequent items which should find a place on the board announcing material available in other bureaus for the use of workers of the office in question. In one instance a notice regarding a supply of brief bibliographies on various subjects resulted in a continuous demand for these lists, and in another case a notice regarding outline maps which the department is prepared to furnish upon request aroused so much interest that it has been exhibited on the board over and over again.

Although the bulletin board is naturally designed to assist in the serious work of the department, there is no reason why advantage should not be taken of it also to promote the interests of the workers in various other ways. For example, Washington possesses many free educational facilities, and there is no reason why notices of lecture courses, or of other matters of general interest to the employees, should not be posted, whether or not they are directly connected with the department.

Once the staff has become alive to the usefulness of the bulletin board material suitable for posting will be contributed voluntarily. Where this scheme has been tried out it has been found that employees traveling in the field have sent attractive exhibits in the nature of post cards and photographs dealing with scenes connected with the work of their particular office, and on one occasion a small-scale set of the photographs which were sent to the Panama Exhibition occupied the entire board for a week. The really important thing, however, is to tell the workers where they may obtain information of value to them. For this reason sources of information should be featured in every way possible.

In connection with the bulletin board a card index suggests itself as a means of making more permanent the information that the board supplies temporarily. No item is too insignificant to be included in such an index if there is any likelihood that it will at a later date supply some one with useful information. Selected lists of addresses, lists of members of committees, memberships of commissions—such things as these form valuable references. Whenever the same question is repeated, it means that it is desirable for the answer to be put in some permanent form.

The branch librarian can also greatly increase the usefulness of the branch library



by developing its relations with the highly specialized libraries in the District. Washington is a great reservoir of knowledge and information. The difficulty is to make this reservoir readily accessible to all who may benefit from it. In the same way, by keeping closely in touch with the office or bureau, the branch librarian will often find opportunities to perform useful work which is outside of the province of any other employee.

## THE ARLINGTON FARM.

*(Contribution from the Bureau of Plant Industry.)*

The activities at the Arlington Farm are at this time (end of June) showing the progress of the season very markedly. The winter cereals, including wheat, rye, barley, and oats, have, for the most part, been harvested, and the product of some of the early plats is being thrashed. The forage-crop planting is practically completed, and most of the crops are well above ground. At practically no time during the year does every plat upon the farm present a more interesting and characteristic appearance than during the late days of June.

In the greenhouses cauliflower and lettuce seed crops have been harvested and some of the new plantings for next season's work have already been made. This is true with roses and carnations. The tobacco work, which is carried on during the winter season in the greenhouses and which extends itself to the open during the summer season, is well under way and presents many interesting features, as well as does also the work in connection with the influence of fertilizers upon the oil content of various oil-bearing plants, which is being carried on in the same laboratories. The soil bacteriological work of the bureau occupies one greenhouse, where a crop has already been harvested. The outdoor features of this work are protected by a cage house of special design.

The laboratory, which is being equipped for the Bureau of Soils for the purpose of providing facilities for experimental work with certain inorganic fertilizers, is rapidly taking shape and, from present appearances, will, when completed, be one of the most useful and interesting laboratories developed in connection with the farm.

The new facilities provided in connection with the soil-fertility work which has for a number of years been conducted both at the Arlington Farm and on the department grounds are being occupied. This provides greenhouse space as well as the necessary laboratory facilities for the study of certain organic constituents of soils.

These improvements, together with the general betterment of the field conditions through tillage, fertilization, and drainage, add materially to the advantages offered for careful investigational work at the farm.

## DEPARTMENT COOPERATION.

The Department of Agriculture, through its threefold activities of research, extension, and regulation, is brought into contact with every other department of the Government, rendering assistance to and receiving assistance from each one of them. Without this cooperation much of the work of the department would be either impossible or accomplished with a far greater expenditure of money and effort than at present. In return the department is able to give the whole people, as represented in various branches of their Government, much the same assistance which it renders to individuals.

### ASSISTANCE FROM THE CUSTOMS OFFICIALS.

In various acts Congress has intrusted to the Secretary of Agriculture power of determining what plants and animals should be kept out of the country in order to prevent the importation of foreign diseases and pests. The Department of Agriculture, however, is not compelled to maintain separate inspection service at all ports of entry. This burden is taken off its shoulders by the Treasury Department through its customs officials. Thus, there is a very close cooperative arrangement in the handling of meat and meat products between the Treasury Department and the Meat Inspection Division of the Bureau of Animal Industry. Until such imports have been inspected and passed by the officials of the Meat Inspection Division, the Treasury Department retains them in its custody.

In the same way all viruses, serums, toxins, and analogous products intended for use in the treatment of domestic animals are not allowed to be imported until a permit is issued by the Secretary of Agriculture. If this permit is not forthcoming the collector at the port holds the articles until the Secretary renders his decision as to their final disposition.

In the enforcement of the Food and Drugs Act, the Treasury Department also actively cooperates with the Bureau of Chemistry. It is the duty of the Bureau of Chemistry to examine all shipments of food and drug products that enter any of the United States ports in order to make certain that they comply with the requirements of the law with regard to adulteration and misbranding. Samples of these imports are furnished the bureau by the Treasury officials and the decisions of the department in disputed cases are enforced by the Treasury Department. So close is this cooperation that in nearly every case the branch laboratories of the bureau at the larger ports of entry are in the buildings occupied by the United States appraisers. At the request of the Treasury Department a conference has also recently been held by the officials of that department

and the Department of Agriculture for the purpose of drawing up revised regulations, for handling imported food and drug products. These revised regulations will, it is expected, be issued shortly.

### THE FOOD AND DRUGS ACT.

On the other hand, the Bureau of Chemistry is occasionally asked to furnish the Treasury Department with scientific information which will assist it in classifying merchandise properly under the tariff act. The internal-revenue laws in regard to alcoholic beverages furnish another instance of the value of collaborative arrangements. In a number of instances it has been found that manufacturers who have violated the food and drugs laws have also violated the internal-revenue laws, and in such cases action is taken under the law which seems most directly applicable.

The Public Health Service is also vitally concerned in the enforcement of the Food and Drugs Act, and there are many questions which arise in regard to this that are settled in conference between the two services. In this connection, too, the State Department renders valuable assistance through its consular offices in supplying information in regard to trade practices, the laws in foreign countries, and in conducting investigations abroad, which greatly facilitate the enforcement of the act in regard to imported articles. In the enforcement of the Food and Drugs Act and in the other regulatory work of the department, the Solicitor's Office cooperates with the Department of Justice in the collection of evidence and the preparation of the Government's case in prosecutions for alleged violations of the law.

In the necessary restrictions upon the importation of foreign birds and animals, the Treasury Department also greatly facilitates the work of the Department of Agriculture. In order to prevent the introduction of animals which are likely to prove pests, such as the mongoose and the flying fox, and of birds likely to prove destructive, all important consignments of this character are inspected by an expert of the Bureau of Biological Survey, the importation being held up by the Treasury Department until this inspection can take place. The traffic in birds is much larger than is usually supposed, last year 475,392 birds being brought into this country, and the importance of this inspection service is correspondingly great.

### WORK ON RECLAMATION PROJECTS.

The Department of Agriculture is, however, fully as much concerned with research as it is with regulation. It is therefore continually called upon by the other departments to assist them with advice and information in regard to many different kinds of Government projects. An instance of this is



in the reclamation work in the West, where the Bureau of Soils, in connection with the Reclamation Service, has mapped the soils and studied alkali conditions in a number of the most important reclamation-project extensions. On seven reclamation projects the Bureau of Plant Industry is carrying on demonstration work in cooperation with the Department of the Interior. The Office of Public Roads and Rural Engineering also includes a Division of Irrigation Investigations, and through this division is in close cooperation with the service in the study of devices for measuring the water delivered to irrigated farms. The law requires that the Reclamation Service base its charges for water on the basis of the quantity delivered rather than on the basis of acreage. There is considerable work to be done before an inexpensive and reliable means for measuring water in field condition can be obtained. Another point calling for the cooperation of the two services is the carrying capacity of concrete pipe and various problems connected therewith.

#### BIRD REFUGES.

One difficulty encountered in a number of reclamation projects is the destruction of the dikes or canals by gophers and other rodents. In 1906 over 50 breaks were caused in this way in the reclamation project at Fallon, Nev. This problem was solved by the Biological Survey, which suggested methods of destroying the pests. On the other hand, the preservation of useful birds is greatly benefited by the assistance which the Reclamation Service gives to the Biological Survey in policing 18 of its reservoirs which had been designated by the President as bird refuges. These bodies of water furnish valuable resting places for ducks and geese in their spring and fall flights and permit the wild fowl to rear their young in comparative security. As more and more of the natural haunts of wild fowl are converted to agriculture, these reservoirs will become increasingly important as refuges for wild birds.

In January, 1912, Forest Island was set apart as a bird reserve, and a warden of the Biological Survey stationed there to protect the gulls, cormorants, and other sea birds also assists in the enforcement of the fisheries laws. The Biological Survey has also contributed expert advice in connection with protection of the seal herds of the Pribilof Islands. In cooperation with the Bureau of Education, the survey has made a beginning in stocking the Aleutian Islands with reindeer in order to supply the natives with occupation and food. The survey is also aiding the Department of the Interior in the work of restocking the national forests with elk. The Department of the Interior is in charge of the elk in the Yellowstone National Park and uses a certain number annually to restock sections where elk have become extinct.

The Weather Bureau is another branch of the department which has found in the irrigation projects in the semiarid regions of the West an opportunity for cooperative work. Here the bureau has been able to aid the work of the engineers by supplying them with accurate records of rainfall and snowfall. In particular, the records of the snowfall in the higher mountains, from which come the storage waters in the spring and summer months, have been of service in designing irrigation schemes.

In these schemes the Forest Service of the Department of Agriculture has also played an important part. Timber from the national forests is furnished free for Federal construction work, and the planting specialists of the Forest Service examine reclamation projects and furnish advice on the kinds of trees to be planted and the methods to be used in construction of windbreaks, etc. The Forest Service is also charged by law with the supervision of timbering on various Indian reservations, and cooperation has been established between the Forest Service and the Indian Office for the further purpose of preventing destructive fires along the boundary lines separating the national forests from the Indian reservations. Furthermore, certain areas in Alaska have been set aside in order to supply adequate quantities of timber for the construction of Federal railroads in the Territory.

#### HELP FOR THE INDIANS.

On several Indian reservations ground squirrels and prairie dogs frequently become such a nuisance that the value of large tracts for grazing purposes is seriously impaired. In these cases a force of Indians and employees of the reservation is placed at the disposal of a specialist of the Biological Survey and the lands freed from the pests by the distribution of poison baits. On the Pima Indian Reservation in Arizona the Bureau of Plant Industry has, in cooperation with the Office of Indian Affairs, been successful in introducing Egyptian cotton and, as a result, white settlers in the Colorado River Valley have adopted it. The Indians thus not only grow cotton themselves but find profitable work in picking that of the whites. A number of other crops besides cotton are being tested, among them Bermuda onions, and the work will probably be extended to other reservations.

In Alaska a reconnaissance survey has been made by the Bureau of Soils of the Territory lying contiguous to possible railroad routes. A report embodying results of this reconnaissance is now in press. In the same way, the Bureau of Soils cooperated with the War Department in a study of conditions in the Canal Zone. As a result of the bureau's recommendations, no attempt was made to reclaim land for agricultural purposes, but such areas as were not needed for the construction of the canal were allowed to revert

to jungle. The bureau has also studied the parade ground at Annapolis with a view to its improvement, made a detailed soil map of the battle field of Gettysburg for the War Department, and contributed information affecting the price to be paid for a horse-breeding farm in the Blue Ridge Mountains.

This matter of the price of land has also offered an opportunity for cooperation with the Departments of the Post Office and Justice. In various cases the Bureau of Soils has assisted in determining the value of lands which were offered for sale by land companies and others in which there was reason to suspect the existence of fraud. In such cases field and laboratory studies have determined the facts which were placed at the disposal of the prosecuting agents. On the other hand, the General Land Office has been of great assistance to the Biological Survey by furnishing it with data in regard to the various islands and tracts of land which are from time to time set apart as bird refuges. At present there are some 69 of these established in various parts of the United States.

#### THE NATIONAL PARKS.

In the administration of the National parks, which are under the charge of the Department of the Interior, both the Office of Public Roads and Rural Engineering and the Forest Service have cooperated actively. Until quite recently some of the most wonderful scenery in our National parks has been almost unknown because of the lack of roads. Cooperative arrangements are now in effect whereby engineers of the Office of Public Roads make surveys at the request of the Department of the Interior and assist in the construction of roads.

The control of destructive insects in the National parks is also now being carried out in accordance with the principles and methods of the Bureau of Entomology. The Department of the Interior details park rangers to the bureau to receive instruction in the practical details of cruising and locating infested timber. The Bureau of Entomology pays the salary of the entomological ranger who furnishes this instruction, while the Department of the Interior pays his traveling and field expenses and the expenses of the park ranger assigned to the work. When the park rangers are sufficiently trained, they are assigned to a National park to work under the immediate supervision of the park supervisor or superintendent.

#### FIGHTING THE SPOTTED FEVER.

The Bureau of Entomology, the Forest Service, and the Public Health Service are all three engaged in fighting in the Bitter Root Valley of Montana the so-called spotted fever, which is believed to be transmitted by a tick. At the present time these three services are endeavoring to ascertain whether or not sheep can be successfully grazed on



the infested areas in order that they may attract ticks which can then be exterminated by the use of dipping vats. The Bureau of Entomology is also engaged with the Bureau of Fisheries in investigating the possibility of introducing certain kinds of fish into mosquito-breeding streams in order to destroy the mosquito larvæ.

Practically all branches of the department are called upon from time to time to aid with information the Army and Navy Departments in the selection of supplies. In particular, it may be said that the Dairy Division inspects the very large annual purchases of butter made by the Navy Department. Last year, for example, the annual purchase amounted to 840,784 pounds. The specifications for this butter are very detailed, and the Dairy Division inspectors have full authority to reject any package which does not comply with them in every respect. The Dairy Division also furnished the plans and specifications for the refrigerating and ice-making plant, as well as the electrical system and pumping plant on the Naval Academy's dairy farm. Furthermore the Dairy Division inspects all factories in which renovated butter is manufactured. Expert advice has also been furnished in response to requests from the Office of Indian Affairs in regard to dairies at Indian schools.

#### WORK WITH THE WAR DEPARTMENT.

The Animal Husbandry Division of the Bureau of Animal Industry is now cooperating with the War Department in the production of horses suitable for military purposes. Three breeding districts have been established with headquarters at Middlebury, Vt., Front Royal, Va., and Lexington, Ky. Under the cooperative arrangement now in force, approved mares may be bred to stallions at these stations without charge provided the Government receives an option on the foal. The division is also cooperating with the Indian Office to improve horses bred on Indian reservations. In 1913 two standard bred, two saddle stallions, four Percheron stallions, and four Percheron mares were purchased with the tribal funds of the Indians. The breeding is supervised by the bureau.

The War Department has also obtained information from the Office of Experiment Stations (States Relations Service) in regard to the digestibility, nutritive value, and keeping quality of various proposed army rations. As a result of this work, a combination of food stuffs which meets the War Department's specifications for emergency rations has been found.

A somewhat similar investigation is now under way by the Bureau of Chemistry in cooperation with the War Department in respect to canned goods. The bureau has made, in fact, a great many tests of food products to furnish the Army and Navy, and expert advice is offered to these depart-

ments in regard to specifications for their annual contract for food supplies.

Another very important cooperative work in which the Bureau of Chemistry is engaged is the determination of standards and definitions for use in connection with the Food and Drugs Act and, in particular, with the net-weight amendment to this act. This work is being done in collaboration with the Bureau of Standards of the Department of Commerce. Close cooperation in it is absolutely essential in order to prevent overlapping and duplication. The contracts laboratory of the Bureau of Chemistry has, therefore, been transferred to the Bureau of Standards, which now tests most of the contract supplies. For certain products, however, such as food and drugs, the Bureau of Chemistry has a large number of experienced analysts, and these products are tested in the department.

With the Bureau of Mines and the Office of Public Roads and Rural Engineering, the Bureau of Chemistry is also taking up the problem of cereal explosions in thrashers, mills, and elevators. This problem is closely connected with that of dust explosions in mines.

#### THE COMMITTEE OF COOPERATION.

Nearly two years ago the Secretary of Agriculture appointed a "committee of cooperation" whose purpose was to coordinate and articulate the forecasting, estimating, and statistical work of all the Government departments. In addition to the Department of Agriculture, the Census Bureau, the Consular Service, and the Bureau of Labor Statistics are represented in this committee. It has already held several meetings and, as a result of these, the Bureau of Crop Estimates has assisted the Bureau of Immigration in developing its scheme for distributing farm laborers among farms in need of help. The Consular Service has also assisted the Bureau of Crop Estimates in securing data on the citrus-fruit crops of southern Europe.

At the present time the Bureau of Crop Estimates uses the census figures of crop acreages and number of live stock as a basis in revising its crop estimates. It also uses the census statistics on the amount of cotton ginned and avails itself of the list of 30,000 cotton ginneries in the United States, which is maintained by the Census Bureau. From these ginneries the bureau obtains information of value in making its estimates of cotton acreages and yields, and by cooperation with the Census Bureau the necessity of maintaining a duplicate list is avoided. From the Office of Foreign and Domestic Commerce the Bureau of Crop Estimates abstracts much data concerning the foreign commerce of agricultural products, and the War Department supplies information concerning production in the islands under its administration—the Philippines, Guam, and Porto Rico. On the other hand, these

(Continued on page 14.)

## RECREATION IN FORESTS.

(Contribution from the Forest Service.)

The most extensive outdoor recreational opportunities of the United States are in the national forests. Within the forest boundaries are nearly all the picturesque wilderness of the country; nearly all the highest mountains and finest alpine scenery; vast unbroken stretches of virgin timber; innumerable lakes and streams, canyons, cliffs, caves, and natural wonders. Governed only by the State fish and game laws and by the Department of Agriculture's regulations to prevent forest fires and watershed pollution, anybody may occupy summer homes and resorts, may hunt, fish, camp, travel, explore, climb mountains, or follow almost any other outdoor pursuit on any of the 163 national forests. In fact, recreation is considered one of the most important uses of the forests, and it is being encouraged by the department as much as possible.

Before the national forests were placed under administration many of the most interesting parts were practically inaccessible. In the last few years, however, the Forest Service has constructed many thousand miles of roads, trails, and telephone lines, so that now nearly all of the best scenery and most desirable locations can be reached with comparative ease. Last year, for example, more than a million persons visited the forests, and up to that time over 2,000 summer homes had been constructed by private individuals on national forest land.

#### LEASING OF LAND AUTHORIZED.

It was to encourage this phase of recreation that Congress last March passed a law authorizing the Secretary of Agriculture to lease national forest land for recreational purposes in tracts of not more than 5 acres for periods not to exceed 30 years. Under this law the Secretary has promulgated a set of regulations which are embodied in a circular recently issued by the Forest Service, for public distribution, setting forth the terms upon which individuals or associations may obtain national forest land for summer homes, resorts, hotels, stores, or other accommodations necessary for public recreation and convenience.

The revokable permit system, to supplement which the leasing law was passed, is still in use, as it is considered satisfactory for persons who desire to occupy only small plots of ground without making substantial improvements. The new system meets the wants of persons who contemplate building comparatively expensive summer homes, and, therefore, wish to feel assured of their tenure of occupancy.



The primary object of the term occupancy permits, as the leases are called, is not to obtain revenue, but to promote the use of national forest land for recreational purposes. At the same time, since permittees receive special benefits, it is regarded as only fair that they should help to reimburse the Government for the expenditures incurred in administering the forests. A revokable permit, which is expected to suffice for persons who intend to build a rough cabin or lodge, ordinarily can be obtained for as low a price as \$5 a year. The rates under the 30-year leasing system range from \$10 a year up, in accordance with the location of the land, the demand for it, and the use to which it is put. Commercial projects, however, are considered on a business basis, and the charge is fixed according to the value of the concession; as, for instance, in the case of a resort to be built at a mineral spring or other specially desirable site, where the rental may be as much as several hundred dollars a year.

#### LEASING REGULATIONS.

Under the regulations the district foresters are authorized to grant permits to applicants who intend to make improvements costing less than \$1,000 and to use the land for a period not longer than 15 years. All other permits will be issued by the Forester at Washington. Applications must be filed with the supervisor of the forest affected, designating the location of the land desired, the use to be made of it, and the approximate cost of contemplated improvements. Examination and survey of the land is made by the Forest Service free of charge. Applications for hotels or summer resort sites must be accompanied by plans and specifications of proposed structures and statements as to their probable cost.

For ordinary summer-home use it is believed that an area considerably smaller than the maximum of 5 acres allowed by the law will be sufficient to meet the demands of most persons. Ordinarily 1 acre or even less will suffice; but it is not expected that permittees will be placed close together unless there is an unusual demand for sites in a particular locality. Permittees are assured, however, that, although they are restricted to 5 acres, it is the policy of the department not to allow others to occupy lands immediately adjacent except in cases of necessity. Forest officers are instructed to prevent monopolistic control of desirable locations by individuals or groups, and no permits are issued for lands which are subject to entry under the homestead law, nor for lands which are needed for public or quasi public purposes. The Forest Service reserves camping or outing grounds where the needs of recreation users call for such a course, and these locations are not subject to exclusive occupancy by individuals under either permit or lease.

The regulations provide, among other things, that permittees shall comply with State laws and with the rules of the Department of Agriculture; that premises be kept neat and sanitary; that all reasonable precautions be taken to prevent forest fires and watershed pollution, and that in the case of a hotel or resort the permittee shall conduct his business in a legal and orderly manner.

Forest officers have been instructed to make preparations for accommodating term occupancy permittees. In localities where it is foreseen that a heavy demand will be made for building sites the forest supervisors are making surveys in order to provide for as many lessees as possible. Reports are being made also on climatic conditions, transportation facilities, distances from centers of population, and other items of interest to prospective users. The Forest Service is not, however, attempting at this time to classify all the recreational opportunities in the forests, and it can not at present advise individuals where they should locate. A person desiring to obtain a plot of national forest land for recreation purposes should personally pick out a site on one of the forests and then file an application with the forest supervisor, who whenever possible will have a forest officer visit the site in company with the applicant so as to avoid misunderstanding. If the supervisor's report is favorable and is approved by the district forester, all that remains for the applicant to do is to pay his rent and "move in."

#### WESTERN WHITE PINE SEED.

Bulletin 210 gives the results of a study to determine the amount and periodicity of seed production by western white pine, another important national forest tree, and the factors which influence them. Seed is collected by the Forest Service on a large scale in the national forests for use in reforestation work, and this is one of a number of similar studies through the results of which it is hoped the Forest Service and professional foresters in general may be able to foretell with reasonable certainty the amount of seed which different species will produce at definite intervals.

**Publications for women.**—A list recently issued by the Division of Publications, "Government Publications of Special Interest to Women," contains a large number of titles, arranged by subjects, of bulletins dealing with the care and preparation of food, household art, gardening, poultry, dairying, home and community sanitation, and health, care, and education of children, issued by the Department of Agriculture, the Department of the Interior, the Public Health Service, and the Department of Labor.

#### FEDERAL MEAT INSPECTION.

Approximately 60 per cent of the animals slaughtered for meat in the United States are killed under Federal inspection. In an address by Dr. George Ditewig, of the Bureau of Animal Industry, before the meeting of the American Academy of Medicine, at San Francisco, in June, the cost of this service was stated to be less than 6 cents apiece. The following is a summary of Dr. Ditewig's paper:

During the fiscal year which ended June 30, 1914, 56,909,000 animals were inspected at a cost within \$3,200,000. In return for this sum people are protected from unhealthy meat; important information is obtained, facilitating the eradication of disease from the herds of live stock in the country; and a profitable branch of the export trade of the United States is preserved. It was this last consideration which led to the earliest enactments by Congress for meat inspection. In the early nineties a foreign market for the great surplus of food animals and meats produced in the United States had become an economic necessity. On the other hand, however, prohibitions and restrictions by foreign governments had been carried to a point where they threatened to prevent the importation of American meats altogether. To meet this situation in 1890 and 1891 Congress passed legislation providing for inspection and certification of the wholesomeness of meats and the soundness of animals intended for export. This legislation was successful in accomplishing its purpose, and the export of meat and animals was greatly facilitated.

The present act, however, under which the meat-inspection service is conducted was not passed until 1906. This law provided that all meats and other products of cattle, sheep, swine, and goats intended for human consumption shall be inspected under the direction of the Secretary of Agriculture before they are shipped in interstate commerce. Retail butchers and farmers who slaughter their own animals on their farms are exempt from the provisions of this law. All meat found fit for human consumption is marked "Inspected and passed" and the rest destroyed to an extent which makes it impossible for use as food.

The use of dyes, chemicals, and preservatives is governed by regulations laid down by the Secretary of Agriculture, and the use of deceptive names is prohibited also. Furthermore, the Secretary has the power to prescribe rules for the sanitation of the establishments themselves.

The force engaged in this work of inspection consists at the present time of about 2,400 employees, appointed under the requirements of the United States civil service. Of this number, approximately 760



are veterinarians and 1,500 lay inspectors; that is to say, experienced men who have not, however, taken any degree from a recognized institution. The remaining employees are administrative officials, specialists, laboratory inspectors, and clerks. In addition to its other work, this force is charged with the inspection of all meat and meat food products which, under the present tariff, are admitted free of duty provided they fulfill the requirements laid down by the Secretary of Agriculture. For the first nine months that this tariff was in operation the imports of meats and meat products were 197,389,348 pounds.

It may appear strange that so much meat should be brought into a country which itself exports large quantities of food. The explanation lies in the fact that although the production of fresh beef and mutton in this country has diminished very considerably in recent years, there is, on the other hand, a considerable surplus in certain lines of pork products, such as lard, oleo oil, edible tallow, and lard substitutes. For this surplus foreign markets must be found and Government certification is necessary to secure their admission into such markets. For the first eight months of the fiscal year ending June 30, 1915, 775,000,000 pounds of meat and meat products were certified for export.

In addition to its usefulness in safeguarding the healthfulness of the people and in making possible an important exporting industry, the Federal meat inspection fulfills another purpose which, though not so obvious, is most important. There are a number of animal diseases, among them tuberculosis, which present no visible symptoms in the living animal until the damage they have done is beyond repair. If these diseases could be eradicated, enormous losses would be avoided. Under the Federal meat inspection the presence of these obscure diseases is detected by an examination at the time of slaughter, and the prevalence of any one of them is a given locality is ascertained in this way much more rapidly than by any other method. Such information is, of course, the first step to a scientific eradication of the diseases. The Federal Government, however, has no authority in itself to conduct a campaign of disease eradication within the territories of the various States, so that State cooperation is essential to progress in this direction.

During the fiscal year which ended June 30, 1914, of the 56,909,000 animals inspected 56,473,000 were passed for slaughter, 281,300 carcasses were totally rejected, and 66,700 animals condemned before slaughter. In addition 3,000,000 parts of animals, however, were condemned after a post-mortem examination; that is to say, a portion of the carcass was found to be unfit for food, while the remainder was wholesome.

## AGRICULTURAL EDUCATION.

Following is an extract from an article on agricultural education by Dr. A. C. True, Director of the States Relations Service, published in the *Annals of the American Academy of Political and Social Science*, May, 1915:

"The American farmer or farm laborer is not a serf or peasant attached to the land. He is free to move about or change his occupation like all other Americans. He surely does not exist simply to produce cheap food-stuffs or clothing for city people. If he stays in the country, it must be because he is convinced that, considering his ability and tastes, he can personally get the most out of life there. Therefore, if city people really feel that they must have a certain number of farmers to support their life and make good business conditions, it is absolutely essential under conditions existing in a free, democratic nation that they shall contribute their part toward making the home, business, and community life of the country people satisfactory to those people.

"The manufacturers, bankers, merchants, railroad men, and professional workers can each contribute to this end in various ways. But in any case a fundamental thing is a good system of education for country people.

"Present-day pedagogy holds that every child should be trained with definite relation to his physical environment and the common arts on which material civilization depends. What may be called the industrial element should therefore be a part of every system of public education, apart from more strictly vocational training.

"This has already led to the widespread introduction of nature study, gardening, cooking, and sewing, into elementary schools and natural science, agriculture, wood and metal working and home economics into high schools. Thus far such instruction has chiefly reached children in urban communities. It should be given to the masses of our children in both city and country.

"But such general industrial training is not sufficient to fit boys and girls for vocations. There must therefore be added courses and schools for definite vocational training, including both secondary and higher schools. This is being done more and more for mechanic arts, engineering, and agriculture."

After reviewing the history and present status of agricultural education, the author says, in part, by way of summary:

"The American system of agricultural education is broadly planned to cover all the technical and practical phases of agricultural practice, the relations of the farmer to the business world, and the organization and life of rural communities. When carried to com-

pletion it will provide definite vocational training for our agricultural experts, teachers, and the great mass of our farmers.

"But it will do much more than this. It will be, and is already to a considerable extent, the foundation and inspiration of a great intellectual awakening among the agricultural people. It aims to change their viewpoint from the past to the future, to bring them into touch with all the progressive and uplifting influences of the modern world and to broaden immensely their outlooks on business and social affairs. If it can do this in a broad way and thus make the great mass of people living in the open country intelligent and progressive it will be one of the largest factors in establishing the perpetuity of our democratic institutions.

"In the present stage of the development of the American system of agricultural education, special stress should be laid on the following things:

"(1) The provision of suitable means for the scientific and practical training of teachers of agriculture and home economics for the elementary and secondary schools and of the county agents and other extension workers.

"(2) Adequate supervision of the teaching of agriculture and home economics in the rural elementary and secondary schools by trained experts connected with the State departments of education who thoroughly understand the problems of country life.

"(3) The encouragement of the consolidation and grading of rural elementary schools with a view to the more efficient organization and equipment of practical instruction in agriculture and home economics, as well as their general improvement as educational agencies. Elementary instruction in agriculture and home economics should be given chiefly through practical exercises in gardens or workrooms connected with the schools, supplemented by projects carried on at the home farm or house and supervised by the teacher. This requires better teachers and more equipment than the ordinary rural schools have at present. It is expected that the club work which the extension agents are developing and which should be closely linked with the rural schools will greatly aid in making the instruction in these schools more practical.

"(4) The use of State funds to aid in the establishment of high schools in rural regions, in which agriculture and home economics shall be taught by teachers trained along these lines, or the introduction of efficient courses in these subjects in town high schools frequented by country boys and girls. Every child should have at least free tuition in a high school located somewhere near his home. We shall find it necessary to rely chiefly on the high schools for most of the instruction in agriculture and home economics which the farm children will receive."



## COTTON-FUTURES ACT.

(Contribution from the Office of Markets and Rural Organization.)

The execution of the administrative provisions of the United States cotton-futures act devolves upon the Secretary of Agriculture in all respects except as to the tax provisions, which are administered by the Treasury Department. The authority conferred on the Secretary of Agriculture is exercised by him through the Chief of the Office of Markets and Rural Organization.

The first administrative duty under the act was the establishment of the Official Cotton Standards of the United States. The standards for white cotton, after a detailed comparison of the various standards in use, were determined upon and promulgated by the Secretary on December 15, 1914. Up to June 1, 1915, 354 sets of the official standards had been distributed throughout the United States and 14 sets had been sent to China, Japan, England, France, Canada, India, Germany, and Holland.

The second administrative duty was the determination and designation by the Secretary of Agriculture of bona fide spot markets for cotton. Investigations were conducted to determine those markets in which cotton is sold in such volume and under such conditions as accurately to reflect the value of Middling and the differences in value between Middling and the other grades of the Official Cotton Standards. These bona fide spot markets were designated. From them were also designated 10 markets the daily quotations of which are made the bases of commercial differences used in the settlement of future contracts, in accordance with section 6 of the act, by exchanges located in cities which are not themselves designated as spot markets. Investigations are conducted from time to time to ascertain that the designated markets are performing the duties required of them and that they continue to be reflective of the conditions represented at the time they were designated. Investigations of the future markets are also made from time to time to determine that the commercial differences established are being used in the settlement of future contracts.

The third administrative duty imposed upon the Secretary of Agriculture is the hearing and determination of disputes as to the grade, quality, or length of staple of cotton tendered in settlement of future contracts. Under the provisions of the act these disputes may be referred to the Secretary by either party to a future contract. The department is not concerned with the performance of the contract. The method of bringing such disputes before the Secretary consists of submitting a sample from each bale of cotton in dispute, properly selected and usually agreed on by both parties to the

dispute, and the filing of the necessary papers as described in regulation 2 of the Rules and Regulations of the Secretary of Agriculture. These samples, upon receipt by the department, are placed in a vault until called for by the clerk to the examiners, who opens and places them in proper order for the action of the examiners a sufficient length of time to allow them to be properly conditioned before they are passed upon.

For the purpose of determining the questions in dispute the Secretary of Agriculture has designated a board of examiners consisting of expert cotton classers. This board is divided into squads of three men each. The personnel of these squads is changed daily so that no three men constitute the same squad for two consecutive days.

An examination sheet is prepared for each dispute, showing the contentions of the parties thereto, upon which no names appear, the dispute being designated by a number. The samples are also identified by number and the examiners have no means of knowing the names of the parties to the dispute involving the samples upon which they are passing. Every sample is examined by each member of the squad. The decision as to each sample is noted on the examination sheet by the clerk. From this examination sheet is prepared the examiners' memorandum of conclusions, which is signed by the three examiners of the squad. Immediately upon completion of this memorandum of conclusions, a copy of it is sent, concurrently, to each of the parties to the dispute, for their information, prior to the issuance of the findings of the Secretary.

Upon this examiners' memorandum of conclusions are based the findings of the Secretary of Agriculture, copies of which are sent, concurrently, to the parties involved in the dispute. These findings have the effect of prima facie evidence in all United States courts.

A memorandum of the charges assessed in each dispute, in accordance with the provisions of section 31 of regulation 2 of the Rules and Regulations, as set forth in the findings, is prepared and forwarded to the parties involved.

Up to June 1, 1915, 418 disputes, involving 39,050 bales of cotton, had been referred to the Secretary of Agriculture for his determination. For the hearing of these disputes charges were assessed amounting to \$13,378.45, which has been turned into the Treasury as miscellaneous receipts.

The Bureau of Plant Industry, Bureau of Entomology, and the Office of Public Roads and Rural Engineering are conducting a cooperative investigation into the mechanical efficiency of the various types of spraying machines now used in orchard operations and similar activities. This work will be conducted in part on the Arlington farm and in part in the field.

## JUVENILE CLUB WORK.

Boys' and girls' clubs are now active in the majority of the States and State leaders or agents have the work in hand in every State in the Union except six. The system of organization in each is well worked out and it is largely a matter of time when the clubs' work will be still more effective and useful. The machinery of organization of these clubs is not complex, yet the ramifications of the boys' and girls' work extend all the way from the United States Department of Agriculture through the State agents and county leaders and through their local organizations. The latter may be almost any club or association which is willing to work in cooperation with the county agent and county superintendent of schools.

Within the county the aim has been to secure the club organization through the leadership of the county superintendent of schools using his teaching forces and others interested. The local school-teacher organizes the club and sends the names and addresses of the boys and girls to the county superintendent or to the county agent. Where the county superintendent cooperates, he directs the work in the county, holds county meetings, formulates the county plan, and settles all county problems.

In the Northern and Western States where there is no demonstration agent in the county, the county superintendent sends the names of club members and their addresses to the State agent in charge of boys' and girls' club work. In a county where there is no demonstration agent and the school authorities take no interest in agricultural clubs, the boys and girls can enroll through the cooperation and assistance of the Grange, a woman's club, mothers' congress, bankers' association, local chamber of commerce, etc. Their names and addresses may then be sent directly to the State agent in charge of boys' and girls' club work. In counties where the educational forces take no interest in club work and a county agent is present, he organizes and directs the clubs. Blanks for enrollment will be furnished by the State agent to the local agents, to superintendents, teachers, and other leaders in this work.

Wherever the school authorities cooperate in the club work, the department has devised a method of helping the teacher correlate her school instruction with the agricultural work of the community through the club work. Thus the school life of the boys and girls is brought into closer relationship to their homes and home activities, and besides the school-teacher has an opportunity to vitalize the work of the school by connecting the agriculture taught in the classroom with the experiences of the boy in his club work.



The State and local agents have found it is comparatively easy to organize clubs but more difficult to keep up the interest of the boys and girls after the work has been started. The test of efficiency for the agents to a large extent is in teaching the children to carry through their work to completion and render a report on the result. It is sought to arouse intelligent and purposeful interest in the work, so that those who join the clubs will continue as active members until they are too old to remain in the organization and then go over into the adult class of farm demonstrators. By "follow-up work" the leader keeps in touch with his members, encourages those who need encouragement, and keeps the members awake to the importance of carrying out the plan carefully considered and proving that they can achieve success.

The ideals sought in organizing clubs of boys and girls are:

(1) To offer to young people guidance that will lead to more efficient and contented farmers and home builders.

(2) To cultivate in boys and girls habits of industry and thrift and to show them the possibilities of the farm and country life.

(3) To demonstrate the best methods of handling farm products and to prevent waste in orchard, field, and garden through home canning and better systems of marketing.

(4) To demonstrate through boys and girls the best farm and home practices.

(5) To assist in the development of the spirit of cooperation in the family and in the community.

(6) To enlarge the vision of the boys and girls and to give them definite purposes at an important period in their lives.

(7) To dignify and magnify the vocation of the farmer by demonstrating the returns which may be secured from farming when it is properly conducted.

(8) To bring the school life of the boy and girl into closer relationship to their home life.

(9) To furnish to the aggressive rural school-teacher an opportunity to vitalize the work of the school by correlating the teaching of agriculture with actual practice.

#### SEVERAL SEASONS' WORK OUTLINED.

A number of schemes have been promulgated to make the club work progressive. Among the boys' clubs a number of systems of crop rotation have been devised. One in practice in the South is a two-year rotation, the first crop being corn, which is followed by a winter cover crop of oats or rye, with clover or vetch, to be turned under. The second year cowpeas, soy beans, or peanuts are grown, to be followed by winter-cover crops to be turned under, returning to corn the third year. In Alabama and Georgia a three-year rotation is being used by a number of clubs, consisting of seed cotton, corn

and oats, and cowpeas. A rotation sometimes used in the North is corn, followed by forage crops, such as alfalfa and clover, and often the project is carried still further by work with poultry, pigs, or baby beef.

In the far Northwest, in Washington above Puget Sound, the State agent has formed an Angora-goat club. This is a specific example of the ingenuity sometimes used by agents in adapting their work to local conditions. This part of Washington is largely covered by heavy forests owned by the Federal Government and large real-estate holders. The locality is so far away from ordinary farm activities and so little agriculture practiced there that the goat club is proving to be a happy combination of interesting and profitable work. The goats' living is obtained free by their grazing in the forests, and at the same time they improve the condition of the forest by keeping down the undergrowth. In the spring the club members benefit through the natural increase in the number of goats and the mohair clipped.

Another example of the agents turning their energies toward the practical as well as the educational in boys' and girls' work is seen in the canning of salmon in Washington and Oregon. About 25 clubs of 20 members each are now doing this work and turn what has heretofore been a waste into a well-preserved article of food.

#### GIRLS' INTEREST SUSTAINED.

In the girls' canning clubs in the South the first year girls grow tomatoes, the second year they divide their gardens into half and grow tomatoes and other crops, and the third year they divide their gardens into three parts and grow three classes of vegetables. In the North and West this plan is somewhat modified to meet the conditions there. The following are some of the combinations that are being worked out in different places in demonstration: Tomatoes, beans, and beets; or tomatoes, peppers, and okra. Just as soon as the girls master these elementary crops they begin to fill their gardens with perennial vegetables and fruits. Thus, it has been worked out that by the time a club girl is ready to leave home to go to high school or college, she will have started a permanent garden or orchard. Some girls have already commenced to work on such combinations as strawberries, asparagus, and cherries; raspberries, rhubarb, and pears; or blackberries, scuppernongs, and figs.

A recent feature of the work in the North and Northwest, which is really an outgrowth and extension of the work already being done in the canning clubs, is the mother-daughter home canning club. This project is to be confined solely to the canning of fruits and vegetables which are grown by

the club members—the mother-daughter team—but the first object of the club is canning, not growing the vegetables. It teaches better methods of home canning, and aids in the utilization of waste products of the farm, orchard, and garden. Like similar work undertaken under different titles, it also cultivates a closer cooperation between the mother and daughter in home interests and activities, teaches economy and thrift, the use of labor-saving devices in canning, and gives helpful ideas for girls' work in cooperation with the mothers in the home during their vacation periods.

The club work, the agents have found, has often been the key to unlock to them the doors of the homes of the farmers and their wives. Many of the agents are using the boys' and girls' products to point out to the parents how they might make their farm and home a better business organization, and a better place to live.

After the boys, in their field, poultry, and animal-industry projects, have faithfully worked out a demonstration, it is a notable fact that their fathers and neighbors invariably take up and practice some of their methods, owing to the fact that the boys' yields and net profits per acre were so much better than in anything that the fathers had ever undertaken. The statement has been made that one corn-club boy in a community who practiced seed selection, seed testing, thorough tillage, frequent and shallow cultivation, and made a big yield and fine net profit on his investment, did more for the good of corn culture in his county than five years of public lecturing and preaching on the subject would have accomplished.

#### NEMATODES IN ENSILAGE.

Nematodes are not infrequently found to be very abundant in ensilage, in fact may occur in such numbers as to constitute an appreciable portion of its volume. This fact is interesting in connection with the nutritive qualities of the ensilage, since samples of ensilage examined contain an appreciable quantity of nematode animal matter, which may be digested by stock to which it is fed.

The observations so far made appear to justify further investigation, as it is not known whether the nematodes are beneficial, injurious, or neutral. The numbers in which they occur suggest that they may sometimes be an important biological factor in the ensilage.

Eligible samples of ensilage for examination in this regard should consist of from 2 to 5 pounds, and should be forwarded, in airtight packages, to the Agricultural Technologist, Bureau of Plant Industry, Department of Agriculture, Washington, D. C.



## FARM LANDS IN FORESTS.

*(Contribution from the Forest Service.)*

Agricultural development of all land in the national forests that is chiefly valuable for farming is the main object of what is known as the land classification work of the Forest Service. By 1909 the national forests contained a gross total of 194,505,325 acres. In this original area were included some lands not chiefly valuable for timber production and water protection.

For the last six years a trimming and cutting down process has been going on to release lands best suited to other than forestry purposes and to rearrange or extend the boundaries of lands of primary value as forest areas. In all, 15,002,265 acres of land have been eliminated through a redrawing of the lines, and 4,855,351 acres have been added. The boundary rectifications were based on careful field examinations which established the character of the land and its desirability for permanent forest use. But boundary changes, no matter how thorough, could not provide for opening to settlement small isolated agricultural areas such as often occur in the midst of the forests. To take care of such lands a special law was passed June 11, 1906. This law is commonly called the "forest homestead law."

This law empowers the Secretary of Agriculture to list with the General Land Office for homestead entry lands in the national forests which in his opinion are chiefly valuable for agriculture and not needed for public purposes. Under it land may be filed upon and patented in advance of the extension of the regular public land surveys. Moreover, it was especially adaptable to the rough mountain regions in which most of the national forests lie, in that it provided for metes and bounds surveys, thereby making it possible to obtain on a homestead a maximum of good land, whereas otherwise considerable poor land might be included in a 160-acre tract.

The first applicants under the forest-homestead law usually were squatters or settlers who had gone on the land before the national forests were established. These people were of two classes—those who intended to till the soil for a living and those who merely wanted the timber. The agriculturist had located on the best farm land in the forests, since he was early on the ground and had had his pick. It was easy for the classifiers to handle his case, for his land really was farm land. Others applied for farm rights on some of the finest timberland, but since this land was not properly classifiable as "chiefly valuable for agriculture" and the chief profit for an owner would be in cutting the timber, such applications commonly were denied. Only in exceptional cases are heavily timbered lands at present sought by new

entrymen, for the spirit of the forest-homestead law is coming to be generally understood.

Up to June 30, 1914, a total of 15,521 individual homestead tracts had been listed by this procedure and made available for agricultural use. The total area involved is 1,684,069 acres. These homesteads might be called "hand-picked"; they represent the cream of the possible farm land in the national forests. In the last fiscal year 3,723 tracts were examined and 2,690 were listed; but it is expected that there will soon be a falling off in the number of listings, since on many of the forests it is becoming apparent that the limit of land at all suitable for agriculture has nearly been reached.

Equally important is the work of boundary revision, which was begun in 1909 and is not yet entirely completed, and the systematic classification of extensive areas where the agricultural and forest values are so nearly balanced as to require painstaking investigation before final decision as to how much of the land is suitable for settlement under the forest-homestead law.

The agricultural appropriation act of August 10, 1912, carried among its provisions a fund for the classification and segregation of lands in the national forests chiefly valuable for agriculture. This permitted the boundary work to be pushed more rapidly and also made possible comprehensive plans for classifying interior lands which might have agricultural possibilities. Since that time 4,063,591 acres have been excluded from the national forests by 45 presidential proclamations, involving 41 different forests in 14 different States. The smallest elimination has been one of 40 acres from the Plumas National Forest in California, and the largest one, of 645,130 acres, from the Cleveland Forest in the same State. California has much the greatest gross acreage of eliminated land, amounting to 1,860,278 acres, or more than 46 per cent of the grand total for all the public-land States.

Although this land has been made available for settlement and entry, it does not necessarily follow that all of it is desirable for agriculture; in many instances low value for forest purposes has been the determining factor rather than high value for agriculture or other uses. Often land was eliminated from the forests because its highest use could be obtained not as independent farm units, but as pastures and wood lots in connection with adjoining farm lands already alienated.

Up to and including June 25, 1915, a total of 16,997,246 acres had been covered by final classification reports which have received the formal approval of the Secretary of Agriculture. Of this area 216,375 acres have been classified as chiefly valuable for

## THE DRUMMOND APIARY.

*(Contribution from the Bureau of Entomology.)*

The department apiary is situated near the western end of the subdivision known as Drummond, Md. Drummond is situated on the west side of Wisconsin Avenue extended, about half a mile north of the District line, and is reached by the Wisconsin Avenue car line. All cars marked "Somerset" run to within a hundred yards of the Drummond entrance. The frame house, which serves as office and laboratory, was until recently occupied as a residence and is of the prevailing suburban type. It is two and a half stories in height and contains eleven rooms. It is set in a large lot, about an acre in extent, flanked on one side by a young fruit orchard and on the other by a level stretch of lawn on which the bees are kept.

Probably the investigations most interesting to visitors and the general public are those on the winter temperature of bees. This work was begun in 1912 in Philadelphia and carried on there during the winters of 1912-13 and 1913-14, being transferred to the Drummond laboratory in 1914. The object of this work is to determine how the temperature of the bees responds to changes in external temperature and other meteorological changes. The problem of carrying bees through the winter is one of the most difficult the practical beekeeper has to face, and a knowledge of the behavior of bees under winter conditions is a necessary prerequisite to the solution of this problem. The methods used are of especial interest. The few previous investigators of this subject have used ordinary mercurial thermometers, making readings at relatively long intervals, and usually disturbing the bees more or less in order to take these readings. The specialists who are conducting this work, however, have made use of electrical thermometers, a number of which can be installed in different parts of the hive. The hive may then be placed wherever desired, and readings made indoors at frequent intervals without disturbing the bees in the slightest degree. These thermometers are of the type known as thermo-couples or thermal junctions, and the readings are made by means of a potentiometer indicator and a sensitive galvanometer of the d'Arsonval type. The wires used in the thermo-couples are copper and constantin (a copper-nickel alloy) and are of small diameter. These thermometers have a sensitivity of about a tenth of a degree Fahrenheit, and are moreover instantaneous in action, so that two readings per minute may be easily made.

Bees do not hibernate during winter, as do most insects, but gather in a more or less compact cluster on the combs in cold weather, consuming their stores and generating heat

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by muscular activity, the rate at which this takes place being determined by the external temperature. Since the relation between the temperature of the bees in the cluster and the outside temperature had already been determined in the course of the first two years work, during the past winter attention was given to other meteorological factors, in particular wind velocity and humidity. Records of these were made by standard recording instruments of the type used in the Weather Bureau, set up in the immediate vicinity of the colonies under observation. Seven colonies exposed to outdoor conditions were kept under continuous observation. Some of these were protected by packing in the usual manner, others were left without special protection. Another colony was placed in the cellar in a small room insulated from the remainder of the cellar by a sawdust-filled space a foot thick. This colony rested on the scale-pan of a special scale, sensitive to one one-thousandth of a pound. The scale itself rests on the floor above, where the readings are made. The food consumption of this colony could thus be determined daily. This colony was also wired and temperature readings made.

Investigations on the development of bees also are in progress. The developmental history of the bee falls naturally into three stages—egg, larva, and pupa. Following this division a thorough study of the embryology, or development within the egg, has been made and will be published in the near future. A study of the structure of the larva is being made at present, preliminary to a study of the relatively enormous changes from the legless grublike larva to the highly developed adult insect. The problem of the structure of the larva is being attacked, first, by dissection under a Zeiss binocular microscope and, second, by means of microtome sections of entire larvæ and parts of larvæ, in order to determine the more minute details of structure. Observations on the food and behavior of the larvæ are also made as opportunity offers.

Other investigations are concerned with the sense organs of the honey bee, especially those organs by which odors are perceived. Observations on the behavior of bees show conclusively that their activities are governed to a very large extent by odors, including those produced by the bees themselves. Their sense of odor is undoubtedly very keen. The specialist's first contribution to this subject demonstrated that the sense-perceiving organs were not located principally on the antennæ, as is usually believed, but on all the appendages, including the wings. These conclusions were based not only on the structure of the organs studied, but also on a long series of experiments with live bees confined in wire cages. The minute structure of a scent-producing organ located on the abdomen of the bee was also studied. More recently attention has

been given to the sense of taste. In addition to this work, in cooperation with the Office of Deciduous Fruit Insect Investigations, studies have been made on the effects on bees of spraying fruit trees while in bloom. Most of these observations have been made in the field.

The problem of the distribution and control of bee diseases will be studied at Drummond during the present summer. Bees in the larval state (brood) are subject to infectious diseases, two of which, known, respectively, as American foulbrood and European foulbrood, are especially destructive and cause large losses annually to the beekeepers of this country. This office has for some years past been examining samples of comb suspected of containing diseased brood in order to assist by accurate diagnoses the beekeepers and the apiary inspectors of the various States in controlling these diseases. Many thousand such samples have already been examined and reports sent to the persons interested. In conjunction with the work, an investigation of the distribution of bee diseases is being carried on and will probably be completed in the near future.

The work of maintaining the bees—dividing strong colonies which threaten to swarm, building up weak colonies, and breeding such new queens as are needed—is in charge of a specialist who has had many years experience in practical beekeeping on a large scale.

#### HOUSE-FLY WORK.

Experiments in control of the house fly in manure are being conducted by the Bureau of Entomology in an insectary constructed on the grounds of the Drummond (Md.) Apiculture Experiment Station, also at the Maryland Agricultural College, College Park, Md., and at the Bethesda farm of the Bureau of Animal Industry.

#### DEPARTMENT COOPERATION.

(Continued from page 8.)

offices utilize the publications of the Bureau of Crop Estimates in connection with their own work. Thus, the Census Bureau confers with the Bureau of Crop Estimates in preparing the forms for the census schedule for agriculture, and the Bureau of Foreign and Domestic Commerce avails itself of the yearly crop reports in compiling the statistical abstract of the United States.

Another cooperative publication is the annual report on the progress of agricultural education. This is published by the Bureau of Education as a joint contribution with the Office of Experiment Stations, or, as it is now called, the States Relations Service. This Service furnishes to the Bureau of Education a record of progress of agricultural education both here and abroad, particularly as shown in the work of the Department of Agriculture.

### EXCHANGE OF FOREST LANDS.

(Contribution from the Forest Service.)

By appropriating \$50,000 to enable the Secretary of Agriculture to exchange solid blocks of national forest land in Washington for State holdings that are scattered here and there within the forest boundaries, Congress has opened the way toward a satisfactory adjustment of what has long been a source of embarrassment both to the State and to the Federal Government. The State is entitled to 500,000 acres, but does not know where its numerous tracts are situated. The location and consolidation of these tracts will get rid of a source of much administrative confusion, and will provide better and more economical fire protection and utilization of the timber and other resources of the national forests and a material increase of the value to the State of its school lands.

The Legislature of the State of Washington also appropriated an identical amount for the same purpose, and this joint fund of \$100,000 will be expended in surveying, examining, and appraising the lands involved in the exchange, which is to be made on a basis of approximately equal areas and values, in accordance with an agreement already concluded between the Secretary of Agriculture and the State of Washington.

The Washington land situation is similar to that in a number of other States where unsurveyed lands were included within national forests. Washington, like many other public-land States, received for school purposes sections 16 and 36 in every township. After a national forest or other Government reservation is established on the public domain, the State still is entitled to its grant, or in lieu thereof an equal quantity of land outside the reservation; but the granted lands can not be identified and used by the State until the Government survey has been extended to include them. Further, these scattered sections, surrounded by lands which the Government is holding permanently for forest purposes, are difficult for the State to dispose of advantageously or to utilize as sources of revenue, while national forest administration and protection are materially complicated by the presence of such lands. By a consolidation of State holdings both parties to the exchange gain.

Land exchanges have been arranged with the States of South Dakota, Idaho, and Montana. The examination of the lands in South Dakota and Idaho has been completed, and the areas which these States are to receive in exchange have been agreed upon. Negotiations with the State of Montana are still pending, only the examination of the lands having been completed. The acreages involved in the Idaho and Montana exchanges were about equal to that of the projected Washington exchange; in the case of South Dakota the area was much smaller.



## FIELD MAN A SANITARIAN.

The field man, whose work brings him into daily contact with the farmer on the latter's own premises, may become, through the exercise of tact and observation, the most effective of sanitary agents. Rural sanitation is a difficult problem. It has been greatly neglected in the past and to-day ignorance, prejudice, inertia, and erroneous notions of economy are allied to resist improvement. Against these, printed arguments are in themselves rather feeble weapons. A direct suggestion, made on the spot, will at least be listened to; in the majority of cases it will be followed.

A simple improvement that in many sections will add greatly to the health and comfort of the farm family is the abolition of all unnecessary accumulations of water. Mosquitoes breed in standing water, and mosquitoes are always a nuisance and at times a menace, for it is through certain species that malaria is spread. Water barrels, troughs, and abandoned wells are favorite breeding places, but it is not necessary for the farmer to put up with them. The well may be filled in, the water barrel and cistern screened, the water trough emptied completely once a week, destroying the eggs laid in it. None of these measures is expensive or overtroublesome. Where they have not been adopted, it is because their value is not appreciated. Thorough drainage of the farm itself will also prove effective in minimizing the pest. Standing water that can not be drained off should be covered with a film of equal parts of crude oil and kerosene and the treatment repeated at the end of 10 days.

The elimination of the house fly is even more desirable than the elimination of the mosquito. Much of the contamination of food with typhoid germs may be traced to the fly and it is also responsible for much diarrhea in babies, commonly known as "summer complaint." Wherever the house fly is held in control, the summer will be found to have much less effect upon the infant. Farmers' Bulletin 679 discusses the house fly in detail.

The best method of attacking flies is to destroy them in their breeding places, usually piles of fresh manure. This can be done by the application of borax at the rate of 10 ounces to 8 bushels of manure, or of powdered hellebore at the rate of one-half pound to 8 bushels. The hellebore is the more expensive, but it can not injure plants, whereas borax in larger quantities than the proportion stated will somewhat retard their growth. A discussion of this question will be found in Department Bulletins Nos. 118 and 245. Another department bulletin, No. 200, describes a maggot trap which can be used to advantage in many cases.

The necessity for screening not only the dwelling but also all the buildings in which food of any sort, but particularly milk, is kept should also be emphasized. Preven-

tive measures outside the house are most desirable, but they should not be considered as taking the place of this precaution.

Animals as well as insects can carry disease, a fact which the field man will do well to call to the attention of those whom he meets. The Biological Survey, indeed, calls the common house rat the most injurious mammal in the United States. The rat is the principal carrier of bubonic plague and is charged also with being an active agent in the distribution of hog cholera. Subjugation of the rat requires united effort, and the Biological Survey will furnish advice and assistance to all willing to enlist in the work. Farmers' Bulletin 369 also tells how to destroy these pests.

There are other animals active in the transmission of disease which the farmer would do well to exterminate. Farmers' Bulletin 484 deals with the best methods of reducing the numbers of badgers, woodchucks, snowshoe rabbits, ground squirrels, chipmunks, and other small mammals. Spotted fever is transmitted by a tick which lives on these animals, turning them in this way into a menace to human health. In California a number of fatal cases of bubonic plague have also been traced to a flea harbored by ground squirrels.

To most Americans bubonic plague appears as a very remote peril; there are other dangers equally great and much nearer home. In the rural districts contamination of the water supply is probably responsible for more illness than any single cause. Carelessness in this respect is only too common, and on premises where care is not exercised the owner's attention should be called to the risks he and his family are daily incurring.

Dug wells, the most common source of water on the farm, are generally stoned up with uncemented joints. The joints should be cemented for a sufficient distance to prevent pollution and at the top there should be a concrete curb of sufficient height and thickness to prevent contamination from the surface.

A vital point is the location of the privy in relation to the well. It not infrequently happens that the privy is so located that drainage from it may seep through the ground and ultimately reach the well. Such a condition is, of course, a perpetual menace to health. Convenience, however, should also be taken into consideration in locating the privy, for otherwise there is a constant temptation, especially for children, to postpone its use. This whole question is discussed at length in Bulletin No. 37 of the United States Public Health Service.

Sanitation should also be an important factor in determining the location of farm buildings. Where these are already in existence it is, of course, useless for the field man to point out how much better they would be somewhere else, but he may often be able to put in a word in time to save a prospective

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## MEAT OFFICIALS CONFER.

(Contribution from the Bureau of Animal Industry.)

The annual meeting of officials and inspectors of the Bureau of Animal Industry in charge of the Federal meat-inspection service was held in Cleveland, Ohio, on June 10 and 11, 1915. These inspectors and some 2,300 assistants, whose training and experience has made them specialists in meat inspection, conduct the inspection of animals slaughtered and supervise the preparation of meat and meat products at 800 establishments throughout the United States. They guard the consuming public against diseased meat and give assurance that the meat and products are sound, healthful, and wholesome at the time they are inspected and passed and have been handled in a sanitary manner. The general purpose of these meetings is to develop information needed by individual inspectors, to unify methods, and to increase the efficiency of the service in all respects. The subjects considered had been submitted in advance by the various inspectors in the form of questions, and their discussion brought out individual opinions, new ideas, and valuable suggestions for improving procedures, all of which will doubtless prove to be helpful to the whole body of specialists.

Since the previous meeting the regulations of the department governing meat inspection were revised to include new features, which were of especial interest to all in attendance.

One of the new features of the revised regulations, which became effective November 1, 1914, provides that packers may sterilize and cook thoroughly certain meat and sell it in sealed cans plainly labeled "Second Class Sterilized." This action follows scientific investigations made by specialists of the department and independent veterinarians and physiologists who have made it clear that large quantities of meat which were perfectly good for food when thoroughly cooked have heretofore been wasted because of the presence of strictly localized lesions in other parts of the animals. Under the present procedure no parts of animals that heretofore were condemned are now passed as second class or allowed to be used for human food under any conditions. This second-class sterilized meat is of the type which most of the Governments of continental Europe have long permitted their packers to sterilize by cooking and to sell at shops in the cooked condition. The sterilized fat of this class of meat has for a number of years been passed for food in the form of lard. The change in the regulations consists merely in passing the sterilized lean meat as well as the sterilized fat of the carcass. The discussion of this subject by the inspectors at



Cleveland developed the fact that while second-class sterilized meat may be furnished the consumer only in sealed cans, this method is not entirely practicable on account of the cost of canning the product, and it was the consensus of opinion that some method other than canning be provided for preparing this class of meat in order that the canning cost may be avoided and the product be delivered properly labeled in some other form to the consumer.

Various questions relating to the sanitation of packing and meat preparing establishments were carefully considered. Special consideration was given to the prevention of fly propagation and to measures for fly extermination about such plants and premises. The discussion showed that the inspectors have given the subject much thought, and good progress has been made in this phase of sanitation. Beginning with the present season the Bureau of Animal Industry entered into a cooperative arrangement with the Bureau of Entomology under which experts from the latter bureau have joined with the sanitarians of the meat-inspection service in making a special study of the subject in its relation to packing houses.

Other questions of importance to an effective administration of the Federal meat-inspection law and regulations were discussed, among them being the inspection of meats imported from foreign countries, the labeling of meats and products, and the methods of controlling the movement of the inedible products prepared at fat and grease rendering establishments in order to prevent the unlawful sale and use of such products for edible purposes.

### IMPORTATIONS OF CHINESE FRUITS.

From the borders of Thibet the agricultural explorer of the Bureau of Plant Industry, Mr. Frank N. Meyer, has sent in a large collection of very interesting plants. Among them are the Tangutian almond, the Potanin peach, and an interesting series of wild forms of the ordinary cultivated peach discovered by Mr. Meyer in the mountains of Shansi, Honan, and Kansu. The expedition succeeded in reaching Lanchowfu, but further progress was prevented by the desertion of the interpreter. The departmental collection of jujubes and persimmons from these western Provinces is largely augmented by the recent collections, and a considerable number of hardy shrubs of probable value for dooryards have been sent in. From the severity of the winter climate of Kansu and Honan it is quite probable that these introductions will thrive over a large part of the United States, with the exception, perhaps, of the upper Mississippi Valley.

## REVISING PHARMACOPEIA.

*(Contribution from the Bureau of Chemistry.)*

Authority to assist in the revision of the United States Pharmacopeia is given to the Bureau of Chemistry in the agricultural appropriation act for the next fiscal year. This authority was requested by the department for the reason that an act passed in 1909 prohibits the use of the department funds for the work of any commission, council, board, or similar body, unless specifically authorized by law. The act mentioned prohibited the department from any participation in the work of the revision of the Pharmacopeia, although it was recognized that the work was of vital importance in the enforcement of the food and drugs act.

The United States Pharmacopeia is not, as might be inferred from its name, a Government publication. It was originally compiled in 1820 and is revised every 10 years by a committee deriving its authority from a convention of delegates representing the professions of medicine, pharmacy, chemistry, and several departments of the Government. The Pharmacopœial Convention assembles every 10 years. At this convention the committee on revision is appointed, which serves until the next decennial convention. The actual work of the revision is carried on by subcommittees appointed from the membership of the revision committee to consider special subjects. Supplements to the Pharmacopeia are published from time to time.

There is contained in the Pharmacopeia, in addition to standards for a large number of drugs, an outline of methods of analysis, various formulas, and tests for the use of druggists, physicians, and analysts in their several professions. It also contains descriptions of the physical properties of drugs, fixes the limits of impurities which may be tolerated, and is an authority on nomenclature.

The food and drugs act provides that when a drug is sold under or by a name recognized in the United States Pharmacopeia, it is adulterated if it differs from the standard of strength, quality, or purity, as determined by the test laid down in the Pharmacopeia, unless the actual standard of strength, quality, or purity of the drug be plainly stated upon the label of the package. As a great many drugs are sold under the name given in the Pharmacopeia, the book is of great importance to the department in enforcing the food and drugs act in its application to drugs. It is regarded as desirable that the department should assist in its revision.

The Bureau of Chemistry in the regular course of its work collects a great deal of useful information relating to drugs, tries out existing methods of analysis, and de-

velops new ones. The results of this work can now be made available for the guidance of the various committees engaged in preparing the pharmacopœial standards and tests. This information, some of which could be obtained from no other source, it is believed, will be of the greatest value to the committees. The additional cost to the Bureau of Chemistry will be nominal as the information is collected in the regular course of its investigations. By cooperating with the committees the bureau will obtain data that will aid greatly in its work and that will more than offset the slight additional cost of the cooperation.

### FARM LANDS IN FORESTS.

*(Continued from page 13.)*

agriculture and suitable for listing; while another result of the classification studies has been the elimination of some 1,000,000 acres in the case of which exclusion of considerable areas from the forests was found preferable to dealing with the situation through listing.

In carrying on this work, the Forest Service is assisted by experts detailed from the Bureau of Soils, whose special function is to define the limits of agricultural land. In correlating all the factors which influence the final classification of land and determine its highest permanent use, the Forest Service takes into account the numerous activities connected with the protection, improvement, and administration of the surrounding forest areas and the development and utilization of their products. In some cases the forest must give way to the farm and land be classified as agricultural, which, taken by itself, is of considerable value for forest purposes and of little value for agriculture, but is so situated that it forms an inseparable part of the rural district, and its protection and management for forest purposes under Federal direction obviously would be an economic error. Similarly, small areas of land are sometimes found which have some excellent agricultural characteristics and little apparent forest value, but are so situated that their use for farming on a practical basis is prohibitive, or their segregation from the forests would be impractical and injurious to successful forest administration.

**Service and regulatory announcements.**—A revision of the regulations promulgated jointly by the Secretaries of the Treasury and of the Department of Agriculture taking effect May 15, 1915, was issued on June 17, superseding all previous regulations under the seed-importation act of August 24, 1912. One important change in the regulations relates to the disposition of refuse from recleaning shipments of seed.



## FIELD MAN A SANITARIAN.

(Continued from page 15.)

builder from a serious blunder. Farm buildings should be located preferably on an eminence, so that drainage will be away from, not toward, them. When other considerations permit, the farm house itself should face southwest, so that sunlight may enter all of the rooms during the day. Abundant sunlight is a powerful sanitary agent. Ventilation should be insured by numerous and good-sized windows, and sleeping porches are advantageous additions. A common criticism of American houses is that they are much overheated. In this connection it is interesting to note that the Chicago Commission on Ventilation has fixed the comfort zone at a temperature ranging from 64° to 70°, with corresponding relative humidities of from 55 per cent to 30 per cent.

An ice house will contribute greatly to the family comfort and health. Department Bulletin No. 98 and Farmers' Bulletins 475 and 623 contain detailed information on this subject.

On farms where much live stock is kept—in particular on dairy farms—cleanliness becomes of even greater importance than elsewhere. This is essential both for the health of the family and of the stock. Dairy sanitation is a subject in itself, but the field man engaged in other work would do well to familiarize himself with at least the outlines of it—Farmers' Bulletin 602 deals with this subject—as well as with the cardinal principles of sanitation on all live-stock farms.

Among these is the thorough cleansing at frequent intervals of feed and watering troughs, pails, etc. Live stock from other farms should not be allowed to drink from the general watering trough, but should be watered from separate buckets. In the same way, horses when on the road should not be watered from public troughs, but from the owner's bucket carried with him. All new animals brought to the farm should be quarantined temporarily. Sick stock should be isolated and the buildings used to shelter them disinfected after they have been removed. Farmers' Bulletin No. 345 describes some common disinfectants and Farmers' Bulletin 480 tells how to disinfect stables.

In feeding stock care is also necessary to prevent the spread of disease. The foot-and-mouth disease gained its start in Michigan last year through the feeding of contaminated skimmed milk to hogs. Skimmed milk should always be pasteurized before it is returned from the creameries, and where this is not done the farmer should take the precaution of boiling it himself. Garbage used for feeding should be cooked, for some human diseases, notably tuberculosis, can be communicated to animals.

Only about 60 per cent of the meat consumed in this country comes from animals slaughtered under Federal supervision. A great part of the remainder is killed on the farm for home or local use. There is therefore need for the farmer to be able to recognize the most common symptoms of disease. It is, for example, not uncommon for tubercular hogs to be slaughtered on the farm and even those portions used in which tubercular lesions actually exist. For the same reason cattle should be tested for tuberculosis and all that react removed from the herd. No stock that has not passed the tuberculin test should be added to the herd.

Whatever his primary purpose in visiting a farm may be, the field man who bears these and similar points in mind will find his opportunities for beneficial activity greatly increased. Cleanliness and efficiency go hand in hand, and the sanitary farm will be found the progressive farm.

## AIDS IN WRITING.

The following named books on writing and editing, which should be of use to those interested in preparing manuscripts, can be consulted in the department library:

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 Bain, A. A higher English grammar. [1897.]  
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 Chicago. University press. Manual of style. 3d ed. 1911.  
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 Sweet, H. A new English grammar logical and historical. 2 v. 1898-1900.  
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 Teall, F. H. English compound words and phrases. 1899.  
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 Teall, F. H. Punctuation. 1898.  
 Toller, T. N. Outlines of the history of the English language. 1900.  
 U. S. Government printing office. Style book. 1913.  
 U. S. Geological Survey. Suggestions to authors of papers. 1913.  
 Vaux, C. B. How to prepare a paper for publication. Read at the Marine biological laboratory, Woods Hole, Mass. 1910.  
 Wendell, Barrett. English composition. 1901.  
 Whitney, W. D. Essentials of English grammar. [1877.]  
 Willis, J. F. Practical punctuation for class and self-instruction. Ed. 3. 1891.  
 Woolley, E. C. Handbook of composition. 1907.  
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## PLANT INDUSTRY REVIEWS.

(Contribution from the Bureau of Plant Industry.)

**Drug plants.**—Interest in the possibility of deriving profit from the growing of drug plants is increasing yearly. The clearing of forests, the extension of the areas of land under tillage, and the activities of drug collectors threaten the extermination of a number of valuable native drug plants. Annually large sums of money are expended for crude drugs imported from countries where they are grown under conditions of soil and climate resembling those of many localities in the United States. As a means of guaranteeing the future supply of crude drugs and of lessening the dependence on importations, attention is now being turned to the cultivation of drug plants with a view to increasing domestic production.

A Farmers' Bulletin (No. 663) by W. W. Stockberger, issued on June 5, considers the more important plants used as drugs to the number of 59, and offers many suggestions in regard to harvesting, yield, preparation for market, distillation, commercial prospects, etc., the purpose being to give information concerning their culture which may be helpful to persons who are considering the production of these plants on a commercial scale.

The problems presented by the cultivation of drug plants are not less difficult than those encountered in the production of many other crops. Drug plants are subject to the same diseases and risks as other crops and are similarly affected by variations in soil and climatic conditions. They require a considerable outlay of labor, the same as other crops, and likewise require intelligent care and handling. They are subject to the same laws of supply and demand, and, like other products, must conform to the consumer's fancy and to definite trade requirements.

A number of common medicinal plants have long been cultivated in gardens in this country, either as ornamentals or as a source of herbs used in cookery and as domestic remedies. A few of these plants, such as goldenseal, wormwood, wormseed, and peppermint, have been grown commercially for sale as crude drugs; but the acreage devoted to their production has been relatively small and for the most part restricted to certain localities. Other drug plants which occur as common weeds in many places may prove to respond to cultivation; experiments should then be undertaken to determine whether it is profitable to grow them.

**Corn in the Great Plains Area.**—In planning the experimental work of the Department of Agriculture to study methods of crop production under dry-land conditions in the Great Plains corn was given a rather prominent place. Experience had shown that in the production of fodder it was at

least as safe a crop, and perhaps as productive, as any that could be grown in a large part of the area. Experience had also shown that corn growing possessed merit as a preparation of the land for a crop of small grain. When these two factors are combined in one crop they make its growth of double importance. Corn is the only crop at present available that offers this advantage, which at the same time lends itself to large acreage and a general farming system. It therefore seems desirable to present data in regard to the actual yields and cost of production of corn under different methods of cultivation and preparation for the crop. This has been done for 14 representative field stations in a region covering about 400,000 square miles of territory in a bulletin (No. 219) of the departmental series, issued on June 2, entitled "Corn in the Great Plains Area: Relation of Cultural Methods to Production," by E. C. Chilcott, J. S. Cole, and W. W. Burr.

The area included in these investigations covers a part of 10 States: Montana, North Dakota, South Dakota, Wyoming, Nebraska, Colorado, Kansas, Oklahoma, Texas, and New Mexico. It extends from the ninety-eighth meridian of longitude to the foothills of the Rocky Mountains and from the Canadian border to the thirty-second parallel of latitude.

After considering the results in more or less detail for the individual stations, a broader view of the entire problem discloses certain conclusions applicable to wider areas, which are set forth and illustrated by a series of graphic text figures.

**Leaves of the date palm.**—At the present time most students of the date rely largely, if not wholly, on the fruiting characters for means of distinguishing the numerous varieties. While it is recognized that in the Old World date-growing countries the natives distinguish almost intuitively the different varieties of dates by the tree habit and leaf characters, little attention has been given to these points by European and American students of the date, and no attempt has been made to systematize these characters. That date trees certainly possess such characters, and that the varietal distinctions are as constant in the trunk and leaf as they are in the fruits, is set forth with graphic detail in a bulletin of the departmental series (No. 223) issued June 23, entitled "Botanical Characters of the Leaves of the Date Palm Used in Distinguishing Varieties," by Silas C. Mason. After developing the system, forms for the use of the observer in applying it are given, and the actual application of the rules evolved to the Deglet Noor variety and its seedlings is explained.

This study is of importance in assisting date work along two very distinct lines—the identification and comparison of varieties, either imported or originating in this

country, and the study of seedlings originating from the cross-pollination of different varieties. The need of a method which this system supplies has been especially recognized in American date gardens in order to compare and describe the different trees in the absence of their fruit and independently of their fruit characters.

**Corn, milo, and kafir in the Great Plains area.**—The results of a study of the methods of production of three important feed crops at three field stations on the southern Great Plains are embodied in a bulletin of the departmental series (No. 242) issued on June 19, entitled "Corn, Milo, and Kafir in the Southern Great Plains Area: Relation of Cultural Methods to Production," by E. F. Chilcott, W. D. Griggs, and C. A. Burmeister. The data presented have been obtained at Garden City, Kans., and at Dalhart and Amarillo, Tex. With the exception of the rainfall, which is less at Dalhart than at Garden City and Amarillo, the climatic conditions at the three stations are very similar. The soils of the three stations are of different types, but they are fairly representative of the more important agricultural types of soil to be found in the southern Great Plains area.

The results of this work show that corn can be depended upon to produce good crops of feed in this section. It does not, however, produce as big a tonnage of feed as kafir and is not as reliable as either kafir or milo in the production of grain. Both milo and kafir have given higher average yields than corn at all of the stations. They have also been safer crops, having made crops of grain in some years when corn did not. They have also been more responsive to cultural operations, thus proving their better adaptation to conditions.

**Irrigation farming in Oregon.**—Since its establishment in 1909, the Umatilla Experiment Farm, located about 2 miles north of Hermiston, Oreg., on the Umatilla reclamation project, has been devoted to the problems of the production of certain truck crops and fruits, dairy farming, and the rearing of hogs. On account of the small size of the farms on the Umatilla project, which contain an average of about 30 acres of irrigable land, it is necessary that systems of intensive agriculture be established. One of the first requirements of successful crop production on this project is to increase the supply of organic matter in the soil, so as to improve the water-holding capacity and productivity and to lessen the danger of wind erosion. It is necessary also that crop varieties suited to the conditions on the project be found and that satisfactory methods be worked out for handling the soil and the irrigation water. A publication issued on June 18, by the Office of Western Irrigation Agriculture, contains a brief account of the progress of this work during the year 1914, by



R. W. Allen. The more important experiments conducted at the experiment farm were as follows: (1) Tests to determine the most economical methods of handling irrigation water, (2) an alfalfa pasturing experiment with hogs, (3) the testing of a number of forage crops, (4) the testing of methods of handling a green-manure crop, (5) experiments on the size and method of pruning fruit trees, (6) variety tests of fruits and vegetables, and (7) the growing of numerous hardy trees and shrubs in order to determine their value for ornamental purposes and as windbreaks.

**Hard spring wheat.**—Many questions are asked each year about the growing of spring wheat. Farmers in the Great Plains area have asked what methods or what varieties are better than those now being used. Those who are thinking of locating in this area have wanted to know what portions are adapted to the growing of wheat and how it may best be grown. Farmers' Bulletin 678, issued June 10, entitled "Growing Hard Spring Wheat," by Carleton R. Ball and J. Allen Clark, is intended to answer some of these questions. The area to which the suggestions apply includes the Dakotas and eastern Montana, the western portions of Nebraska and Kansas, and the eastern parts of Wyoming and Colorado. Many things besides soil are important to wheat growing. Such influences as rainfall, temperature, wind, and tillage methods usually are the things of greatest importance in this section. However, the kind of soil and its fertility may govern the successful growing of wheat in some places. The subject is considered from the practical standpoints of rotations, preparation of the seed bed, kind of seed, methods of seeding, harvesting, etc., and numerous helpful conclusions are presented.

**Commercial hay in the South.**—The quantity and value of hay brought yearly into each of the cotton-producing States recently has been approximately determined by the Bureau of Crop Estimates. These figures, with an estimate of the increase in acreage in each State necessary to produce the tonnage now imported, are shown in a Farmers' Bulletin issued on June 16, entitled "Growing Hay in the South for Market," by C. V. Piper, H. B. McClure, and Lyman Carrier. They show that more than one-fifth of all the hay used in the South is shipped in from other parts of the country. There must be some serious obstacles in the way of producing hay when a great agricultural section imports so large a proportion of all the hay it uses. The most serious difficulties in the way of producing market hay in the South are (1) the lack of plants adapted to the soil and climate that will make a hay capable of competing with timothy, red clover, and alfalfa, and (2) the danger of rainy weather during the period of curing the crop. The various factors

which constitute these obstacles are considered from the practical standpoint of overcoming them. Growing hay for market in the South is a profitable business where the soil conditions are favorable for its production.

**Hard clover seed.**—The seeds of many species of the clover family are frequently incapable of readily taking up the water necessary for their germination. The reason for this incapacity is that the seed coats of such seeds are completely waterproof—at least for a time. Seeds having such impervious seed coats are known as hard-coated seeds, or simply as hard seeds.

Farmers' Bulletin 676, by George T. Harrington, is devoted to a consideration of the treatment of such seeds in the hulling process. The question of the agricultural value of these hard clover seeds has been much discussed. Nearly all such seeds will lie in water or in wet cloths for many months without change, and frequently many of them will remain unchanged after several years in water. As soon, however, as the waterproof seed coat is broken or becomes permeable to water the seed takes up water rapidly and usually germinates, producing a strong, healthy seedling. It is of importance to the farmer who sows clover seed that germination should occur promptly instead of after a delay of indefinite duration, pending a change in the seed coat. Herein lies the greater value of clover seed which is not hard; that is to say, which is not impervious to water. A number of machines have been devised at different times for the purpose of scratching or abrading hard seeds so that they will germinate readily. The rubbing which clover seed receives in the hulling machine greatly reduces the proportion of hard seeds, but frequently breaks some of the seeds. The clover-seed huller is found to be an effective scratching machine. The aim should be to have the huller so constructed and so operated as to reduce the proportion of hard seeds to the greatest possible extent and at the same time to break the smallest possible number of seeds.

**Range management.**—The present status of the stock-raising industry in New Mexico is but one phase of the adjustment of the various industries of the State among themselves and to the physical environment. A timely contribution to the subject was issued as Bulletin 211, entitled "Factors Affecting Range Management in New Mexico," by E. O. Wooton.

Stock raising is more influenced by and dependent upon its physical environment than most industries appear to be. The topographic and climatic conditions are fundamental, because they determine the kind and quantity of feed the animals must eat, the temperature and other extremes they must endure, and the various dangers which they must avoid. The laws and cus-

toms of the region determine the character of the tenure and control of the land which produces the feed upon which the animals subsist. The management of the controlled range is contrasted with that now possible. It is shown that the present form of control can result in nothing but overstocking. The present method of controlling the Government lands depends upon the legal control of the stock water and a custom which has the force of an unwritten law. This condition has arisen from lack of legislation which takes all the conditions into consideration. While no type of legislation is recommended, it is urged that some type of legal control is not only desirable but very necessary for the further development of the industry.

**Zygadenus.**—C. Dwight Marsh, A. B. Clawson, and Hadleigh Marsh have brought out Bulletin 125, entitled "Zygadenus, or Death Camas," a detailed statement of the losses caused by this scourge of the western sheep ranges, with the various symptoms of poisoning exhibited. While Zygadenus is poisonous to horses and cattle, the fatalities are almost entirely confined to sheep.

It is shown that if sick animals are kept quiet many of them will recover, but no satisfactory medical remedy is known.

**Prickly pear.**—In Bulletin 208, Yields of Native Prickly Pear in Southern Texas, Dr. David Griffiths describes the results of cultivating these cacti for forage at Brownsville and San Antonio, Tex. Yields ranging all the way from 2 to more than 100 tons per acre were obtained. The yields are shown to be in direct proportion to the care given the plantation, the most potent factor in growth after the plants are established being cultivation.

**Fiber flax.**—The production in the United States of fiber flax is the subject of a Farmers' Bulletin (No. 669), prepared by Frank C. Miles and bearing the title "Fiber Flax," referring to a variety distinct from seed flax, to which less than 2,000 acres are now devoted in this country, while 3,000,000 acres are devoted to seed flax.

Fiber flax yields both spinning fiber and seed suitable for oil production, while the straw of seed flax grown in the Northwest does not yield a fiber suitable for spinning. Russia has been producing about four-fifths of the world's supply of flax fiber, while about one-third of the flax spindles in the world are in Ireland.

The United States imports annually about \$3,000,000 worth of flax fiber and more than \$20,000,000 worth of linen goods, although the climatic and soil conditions in various sections of this country are favorable for growing fiber flax. A relatively low temperature and sufficient moisture during the growing season are desirable. In general a loam soil with a clay subsoil is to be rec-



commended. The preparation of the seed bed is one of the most important factors in the culture of this flax. Sod should be fall plowed. The seed bed should be rendered fine and compact before seeding. The seed should be thoroughly cleaned and graded and should be treated with formaldehyde. It should be sown broadcast at the rate of about 6 pecks per acre and should be covered not more than half an inch deep. Seed should not be sown on soil infested with weeds, since the weeds must be removed at some time before the fiber can be spun. As flax diseases live in the soil a number of years, it is not advisable to plant flax on the same field more frequently than once in seven or eight years.

An average yield of fiber flax in this country is about 2 tons of unthrashed straw per acre, from which 6 to 10 bushels of seed and 400 to 550 pounds of clean retted fiber may be obtained. The preparation of the fiber requires technical knowledge and should be undertaken only by those experienced in that line of work. In the past, the market has been an important factor in discouraging the production of fiber flax in the United States, but it has been repeatedly demonstrated that excellent fiber can be produced here.

#### ORGANISMS ON AQUATIC INSECTS.

Between 20 and 30 species of microscopic organisms have been discovered on the legs of some aquatic insects from Costa Rica and sent to the office of Agricultural Technology for identification by the Department of Zoology of the University of Pennsylvania. As a considerable number of aquatic insects are capable of extended flight, the investigation of these specimens throws interesting light upon the distribution of such microorganisms, the sudden appearance of which in large numbers in new localities is often unexplained. The bearing of this upon the rapid growth of these possibly dangerous forms of life in reservoirs and other sources of drinking water is evident.

The department is now spending money to develop the live-stock industry in connection with the reclamation projects, and is asking for more. But unquestionably the largest hope for a considerable increase in our meat supply lies in four other directions: First, in a more satisfactory handling of the public grazing lands; second, in systematic attention to the production of beef animals in the settled farming areas of the country, particularly in the South; third, in increased attention to the smaller animals, such as swine and poultry; and fourth, in the control and eradication of the cattle tick, hog cholera, tuberculosis, and other animal diseases and pests.—Annual Report, 1914.

### ENTOMOLOGY ABSTRACTS.

(Contribution from Bureau of Entomology.)

**Timber beetles of subfamily Cryphalinae.**—The subfamily Cryphalinae of the family Ipidæ includes a group of ambrosia beetles, known also as pinhole borers and timber beetles, which work serious injury to crude forest products, wine and beer casks, and similar articles; it includes also a species which is destructive to the tea plant in Ceylon, and many that infest seeds, notably those of the date palm. The superfamily Scolytoidea, in which the Cryphalinae are included, is represented in both hemispheres by some of the most destructive insect enemies of forest trees and their commercial products, by several species which injure or destroy fruit trees, and by a very destructive enemy of clover. Report No. 99, Office of the Secretary, "Classification of the Cryphalinae, with Descriptions of New Genera and Species," by A. D. Hopkins, is a systematic revision of this important group based on field and laboratory studies carried on by the author during the past 20 years, including first-hand studies of the material in this subfamily represented in the collections of the United States National Museum and the Le Conte collection in the Museum of Comparative Zoology, Cambridge, Mass. Descriptions of many new genera and species from various parts of the world are given, among these being a considerable number from the collection of the Biological Laboratory, Bureau of Sciences, Manila, P. I.

**Woolly apple aphid.**—One of the most troublesome and widely distributed apple pests is the woolly aphid, *Eriosoma lanigera*. Although the ravages of this "louse" have been known for over a century, its life history has remained little understood. In Report No. 101, Office of the Secretary, under the title "The Woolly Apple Aphid," Mr. A. C. Baker gives the results of a detailed study of this insect begun in January, 1912. The species which occur on elm were studied on account of their structural similarity to the woolly apple aphid, and the discovery was made that elm is the primary host of the woolly aphid. This serves to corroborate conclusions reached independently by Miss Edith M. Patch as a result of experiments carried on by her during the same period, but not known to the writer at that time, and published during the summer of 1912. Counting the egg as one stage and one form, *Eriosoma lanigera* occurs during its life cycle in 41 different stages, 7 generations, and 8 distinct forms. The first 4 of these forms normally inhabit the elm; these include the egg, the wingless so-called stem mother which hatches from the egg in the spring, the spring wingless female to which the stem mother gives birth, and the spring migrant or winged form which is born of

the spring wingless female. The spring migrant flies to the apple, and from it come two generations of wingless forms, known as summer wingless females; the first of these generations lives above ground, on the twigs, leaves, and water sprouts; of the second generation, many migrate to the roots, but others remain upon the twigs and give birth to a winged generation, known as fall migrants, which fly back to the elm and there produce the oviparous or egg-laying females and the males—the only sexual generation in the life cycle. From these last come the eggs; one only is laid by each female, in a crevice of the elm bark, and here it passes the winter, to hatch into the stem mother the following spring. The injury produced by the woolly aphid consists of tumors and gall formations on the leaves, stems, roots, and sometimes on the fruit, which develop at points where the insects have been sucking up the plant juices. The various forms and stages are described in detail and the structure of the species is discussed rather fully as a basis for future work on other members of the family Aphididae. The original summer food plants of *Eriosoma lanigera* are believed to have been the thorns (*Crataegus*), as the species occurs on these trees in their native home and has transferred itself to apple upon the planting of orchards in regions in which *Crataegus* is found. The woolly aphid is believed to be of American origin and to have been introduced from this country into Europe a little over a century ago.

**Cotton weevils from Peru.**—The fact that there is more or less commerce between Peru and the United States in cotton seed, and the further fact that some of the most important pests to Peruvian cotton are weevils, which might be imported into the United States in shipments of cotton seed, render all available information in regard to these Peruvian cotton weevils of value. Mr. W. Dwight Pierce, in Report No. 102, Office of the Secretary, entitled "Descriptions of Some Weevils Reared from Cotton in Peru," describes three new species of bruchids, or "bean weevils," and four new species, including one new genus, and two previously known species of true weevils, or Rhynchophora, reared from cotton stalks, squares, and bolls by Mr. C. H. T. Townsend, entomologist of Peru. By far the most important species in the series was the Peruvian cotton-square weevil, *Anthonomus vestitus*, a form which belongs to the same genus as the notorious Mexican cotton-boll weevil that is overrunning the cotton-producing area in the United States.

**Roundheaded borers of subfamily Prioninae.**—Among the most injurious pests to forest trees and forest products are the larvae or grubs of long-horned beetles of the family Cerambycidae. The various species in the adult or beetle stage are com-



paratively well known and can, as a rule, be readily identified, but the larvæ, known as roundheaded borers, have not heretofore been thoroughly studied, so that often it has been impossible to determine the species to which they belong, when the specimens have been dead or when it has not been possible to rear them. Mr. F. C. Craighead has, during the past few years, made a study of these borers as contained in the collections of the United States National Museum and especially in that made by the Forest Insect Investigations of the Bureau of Entomology. When he began his work there were only about 50 authentically determined larvæ in these collections. As a result of his studies and rearings, however, there are now some 250 species which can be determined in the larval stage. In Report No. 107, Office of the Secretary, "Contributions Toward a Classification and Biology of the North American Cerambycidae. Larvæ of the Prioninae," Mr. Craighead describes the known larvæ of the first subfamily of the Cerambycidae. The paper includes a general discussion of the habits and structure of cerambycid larvæ, a key to the subfamilies of the Cerambycidae based on the larvæ, an account of the general anatomical characteristics of the prionine larvæ, and a key to the genera of the Prioninae based on larval characters. The specific descriptions include many notes on habits and host trees. The Prioninae include some of our largest long-horned beetles.

**Wheat thrips.**—In the Journal of Agricultural Research for June Mr. E. O. G. Kelly gives an account of a new enemy to wheat, under the title "A New Wheat Thrips." This insect, *Prosopothrips cognatus*, was described as new by Mr. J. D. Hood in 1914, from material collected by Mr. Kelly. The species has been found to occur in all parts of Kansas, in Oklahoma, at two places in western Missouri, and in one locality in extreme southern Nebraska. Wheat is the only cereal known to have been damaged by this insect, although several species of wild grasses are host plants. Injury is confined to the leaves of young plants, unfolding heads and newly formed grains of wheat, and to the young unfolding leaves of some grasses, and is caused by the puncturing and laceration of the tissues of the upper epidermis of the leaf, or integument of the grain, and the sucking out of the juices by both larvæ and adults of the thrips. The injured leaves often become badly mutilated and soon acquire a "rusty" appearance, and often they prevent the new shoot from developing. In the heads of wheat the thrips attack first the blossom, the pollen being greedily eaten and the stamens and pistils badly lacerated; later they attack the husk and finally the tender integument of the newly forming grain, causing the grains to shrivel. The eggs of the thrips are deposited in the tissue of the young leaves,

usually on the ventral side; they hatch in from 6 to 10 days, the larval period covers from 10 to 12 days, the pupal stage from 10 to 12 days, and after emergence from 2 to 3 days elapse before the female is ready for egg laying; the complete life cycle thus covers from 30 to 35 days, and there are from four to five generations each year. Among the more important enemies of this wheat thrips are a small bug, *Thripheps insidiosus*, and larvæ of a lacewing fly, *Chrysopa oculata*. Where this thrips becomes numerous the burning of stubble fields and plowing them early, destroying all grasses and especially volunteer wheat, will tend to reduce its numbers and keep it under control.

**Sugar-cane weevils.**—Growers of sugar cane throughout the world find that the weevils which bore in the subterranean portions of the stalk and in the root crown are, because of the methods of cultivation and propagation in vogue in this industry, among their most serious enemies. One of the most important groups of economic weevils in the West Indies is the genus *Diaprepes*, the sugar-cane infesting forms of which are treated by Mr. W. Dwight Pierce in an article entitled "Some sugar-cane root-boring weevils of the West Indies," in the June number of the Journal of Agricultural Research. These weevils are so extremely variable in color, shape, and markings that it is a matter of great difficulty to determine the limits of the species. From a study of material from Porto Rico and many of the smaller West Indian islands it appears that there are only two species which infest sugar cane, namely, *Diaprepes spengleri* and *D. famelicus*. The first of these may be separated into six varieties, five of which are designated by old, well-known names—*marginatus*, *comma*, *spengleri*, *abbreviatus*, and *festivus*—and one by a new name, *denudatus*. Several of these varieties, in turn, may be divided into a number of subvarieties, each of which is characterized and given a distinguishing letter for its designation. Over 40 different variations are described, based on over 250 specimens coming from the United States National Museum, the Porto Rico Sugar Growers' Association, the Porto Rico Experiment Station, and the Imperial Agricultural Department of Barbados. The remedies that have been suggested for the control of these sugar-cane root borers are spraying with arsenate of lead, crop rotation, breaking up infested stumps to expose the grubs to the attacks of ants and birds and subsequently burning the stumps, and hand picking of the adult weevils from April to June.

**Southern corn leaf-beetle.**—From a number of localities throughout its range in the southern half of the United States have, during recent years, come reports of damage to young corn by *Myochrous denticollis*, the southern corn leaf-beetle. Indications of

the presence of this pest are the ragged appearance and notched edges of the corn leaves, and where the beetles are sufficiently numerous the notches are so abundant that the plant dies. Although corn is the only crop known to have been seriously damaged, the beetles have been observed to attack the young leaves and growing shoots of cocklebur, smartweed, Japan clover, and crab grass, and they have been observed feeding on sorghum, cotton, and *Alopecurus geniculatus* in the field and on alfalfa in rearing cages in the laboratory. In Bulletin 221, "The Southern Corn Leaf-Beetle," Mr. E. O. G. Kelly summarizes the known facts regarding this insect and gives the data concerning its habits and life history that have been gathered during investigations of its outbreaks in southern Kansas, northern Texas, and eastern Arkansas during the years 1910, 1913, and 1914. The female beetle deposits her eggs in clusters of from 10 to 50 in small pieces of weeds, hollow straws, crevices, and clods of dirt, but always near corn plants. Numbers of the larvæ have from time to time been found in the soil, and always in close proximity to corn roots, but have never yet been actually observed feeding on them, although injured roots which were evidently eaten by them have been discovered. Pupæ are found in earthen cells in the soil near corn plants at depths of from 4 to 6 inches. The adults are dark brownish beetles about three-sixteenths of an inch long and about one-third as wide; they have powerful wings and have been observed in fields long distances from where they originated. Injury by the larvæ to the corn roots appears to be confined almost entirely to the dark waxy second bottom land or soil of that general character, very few injured roots and very few larvæ and pupæ having been met with in light or sandy soils. Judging from the conditions of fields in which the beetles have been observed hibernating in large numbers, the cleaning up of all rubbish in the cornfields early in the fall, especially in fields for very late corn, would prove an effective measure for the protection of the succeeding crop. If the rubbish and trash from cotton gins were used for boiler fuel, large numbers of beetles would be destroyed, also, as this appears to be a favorite place for their hibernation. If a crop is so badly damaged as to be worthless it may with safety be replanted about one month after the regular planting time, and it has been found that corn planted three or four weeks after the regular planting time has escaped injury from the beetle. Finally, it appears that the beetles may be destroyed by a poisoned-bran bait, consisting of 25 pounds of wheat bran, 1 pound of Paris green, 1 gallon of low-grade molasses, and the juice of 3 oranges, with enough water to bring the mixture to a stiff dough, the bait being scattered lightly on the ground among the plants where the beetles are at work.



**Wireworms.**—Bulletin 156, "Wireworms Attacking Cereal and Forage Crops," by J. A. Hyslop, discusses the injuries to cereal and forage crops, life histories, food plants, and remedies for the species of wireworms of primary and secondary importance in the United States. These insects, which are larvæ of click-beetles (family Elateridæ) are among the serious pests to corn, wheat, and oats and are important enemies of many other crops. Differences are pointed out between the true wireworms and the larvæ of other beetles and certain millipedes, which are sometimes mistaken for wireworms. Results of experiments indicate that cultural methods are the only remedial measures of practical value, although the protective treatment of seed and the introduction of poisonous or noxious substances into the soil have been advocated by certain writers.

**Cactus solution.**—Bulletin 160, "Cactus Solution as an Adhesive in Arsenical Sprays for Insects," by M. M. High, gives the results of tests of solutions of the prickly-pear cactus in water, added to various arsenical sprays used against the belted cucumber beetle (*Diabrotica balteata*). It was found that where these cacti are prevalent solutions made from them can be used instead of other substances, such as fish-oil soap, which are customarily added to the arsenical to make it adhere better to the foliage and spread more evenly; in fact, the cactus proved superior to fish-oil soap in this respect. It is applicable to other insects of related habits.

**Fumigating seed.**—Bulletin 186, "A Method of Fumigating Seed," by E. R. Sasser and Lon A. Hawkins, gives the results of experiments which show that the fumigation of seeds by the introduction of hydrocyanic-acid gas into an air-tight chamber, from which the air has been practically exhausted by means of an air pump, is effective with a considerably shorter exposure to the fumigant than is necessary in the usual method of seed fumigation, and without injury to the seed. The apparatus used is described in detail. The bulletin is a joint contribution from the Bureau of Entomology and the Bureau of Plant Industry.

**Insects in Porto Rico.**—Bulletin 192, "Insects Affecting Vegetable Crops in Porto Rico," by Thomas H. Jones, is a consideration of the insects which, from published references and from observations made by the writer while a member of the staff of the Porto Rico Sugar Producers' Association and a collaborator of the Bureau of Entomology, have been found to be injurious in that island. Notes on about 50 species are given and a number of parasitic and predaceous enemies which help in the natural control of some of them are recorded. While many of the species mentioned already occur in the United States, several are not yet known to be present, and steps are being taken to prevent their introduction.

## SOIL SURVEY PROJECTS.

The following assignments for soil surveys have been approved by the Assistant Secretary:

**Alabama.**—The soil survey work in Alabama is in cooperation with the Department of Agriculture and Industries, and during the field season will cover Monroe and Wilcox Counties in the south-central portion of the State and Pickens County in the northwestern part. Monroe contains 1,012 square miles, Wilcox 896, and Pickens 875 square miles. Two men from this department and four from the State will conduct the field operations.

**Arkansas.**—The soil survey work in Arkansas will consist in completing a survey of Yell County. This work was begun last October and should be completed during the present season. The area comprises about 1,000 square miles. This work is in cooperation with the Arkansas Agricultural Experiment Station, one man being assigned from this department, assisted by a representative from the State.

**California.**—The soil survey work in California is conducted in cooperation with the agricultural experiment station and is carried on throughout the entire year, in the southern part of the State during the winter season and in the northern part during the summer. Four men from this department, assisted by an equal number from the State organization, are to finish detailed areas around Pasadena and San Bernardino and reconnaissance work in the San Diego region. Upon completion of these areas these parties will take up detailed surveys in the Russian River Valley and Honey Lake district and reconnaissance work in the San Joaquin Valley.

**Delaware.**—New Castle County, covering an area of 435 square miles, has been selected for soil-survey work during the season, with one representative from this department and one from the State. The work is in cooperation with the agricultural experiment station.

**Georgia.**—The State College of Agriculture of Georgia in cooperation with the Department will conduct examinations of the soils in Wilkes County during the season, covering an area of 458 square miles.

**Idaho.**—Latah County, Idaho, is being surveyed in cooperation with the agricultural experiment station of the State. This work was begun last season, and under favorable weather conditions the field work will be completed during the present season. It covers an area of about 900 square miles, one man being assigned from this department, assisted by a representative from the State.

**Indiana.**—In cooperation with the Indiana Geological Survey, soil surveys will be made covering Grant County with 423 square miles, Wells County with 365 square miles, and White County with 507 square miles. Three representatives from this department will be assigned to these areas, assisted by an equal number from the State organization.

**Iowa.**—Clinton County, with an area of 691 square miles, Scott County with 449 square miles, Sioux County with 760, and Van Buren County with 477 square miles

will be assigned for soil surveys in Iowa during the season. One representative of this department will be in each county, assisted by an equal number from the State. Under favorable conditions all four of these counties should be completed during the field season. The work is in cooperation with the Iowa Agricultural Experiment Station.

**Kansas.**—During the 1914 summer season soil survey work was begun in Cowley County, Kans. This work will be continued during the present season in cooperation with the State college, and under favorable weather conditions it is hoped that the 700 square miles remaining in that area can be covered by a soil survey.

**Kentucky.**—Jessamine County, covering an area of about 200 square miles, has been designated for survey for the summer season. One man from this department will conduct the field examinations in that county.

**Maine.**—Soil survey work will be taken up in Cumberland County, Me., by two representatives from this department and carried on throughout the field season.

**Michigan.**—Two men from the department have been assigned to make a detailed soil survey of Calhoun County, Mich., covering an area of about 700 square miles, and with favorable weather conditions this county should be completed during the season.

**Missouri.**—Three areas in Missouri will be covered by soil surveys during the season, namely, Buchanan County, 408 square miles; Newton County, 640 square miles; and Ripley County with 627 square miles. Three men will be assigned from this department, assisted by an equal number from the State, the work being carried on in cooperation with the Missouri Agricultural Experiment Station.

**Nebraska.**—In cooperation with the Division of Soils of the University of Nebraska, soil survey work will be carried on during the season, and definite assignments covering Dawes, Polk, Richardson, and Washington Counties have been made. Four men from this department have been assigned to these areas, with an equal number from the State organization.

**New Jersey.**—Soil survey work was begun last season in an area around Camden, in cooperation with the New Jersey Agricultural Experiment Station and the State Geological Survey. The work will be extended during the present season and a report and map prepared covering the two seasons' work.

**New York.**—Schoharie County, covering an area of about 642 square miles, has been selected for soil survey work for the present season, with one representative from the department, assisted by one man from the State, the work being in cooperation with the State College of Agriculture through the Cornell University.

**North Carolina.**—The soil survey work in North Carolina is carried on throughout the year with three men representing this department, assisted by three from the State organization, the assignments for the present season to cover Alleghany, Anson, and Davidson Counties. The work is in cooperation with the North Carolina Department of Agriculture.



**North Dakota.**—In cooperation with the North Dakota Agricultural Experiment Station, a detailed soil survey will be made of Bottineau County, comprising an area of 1,681 square miles. The party will consist of two men from this department and two from the State organization.

**Ohio.**—The work in this State will include detailed soil surveys of Miami County with 408 square miles, Hamilton County with 405 square miles, and an area of about 300 square miles in Geauga County. The work will be carried on in cooperation with the Ohio Agricultural Experiment Station.

**Oklahoma.**—A detailed soil survey of Kay County, Okla., covering an area of about 934 square miles, will be taken up during the season by two representatives from the department.

**Pennsylvania.**—In cooperation with the Pennsylvania State College and Experiment Station, detailed soil surveys will be carried on in Blair and Cambria Counties, with two representatives from this department and an equal number from the State.

**Vermont.**—The assignment for this State will cover a detailed soil survey of Windsor County, and two men from this department will conduct the field examinations.

**Virginia.**—The soil survey assignment in Virginia will consist of a detailed survey of Fairfax County, covering an area of 417 square miles.

**Washington.**—A detailed soil survey of Benton County, Wash., has been authorized, covering an area of 1,671 square miles. The State Geological Survey is cooperating in the work.

**West Virginia.**—Gilmer County with 331 square miles and Lewis County with 393 square miles have been designated for detailed soil surveys in West Virginia during the season, in cooperation with the West Virginia Geological Survey.

**Wisconsin.**—The soil survey work in Wisconsin will consist of a reconnaissance survey in the central part of the State, covering Lincoln, Clark, Taylor, and Marathon Counties, and detailed surveys of Portage and Wood Counties. If this work is completed in time, Rock County will also be covered by a detailed survey. Four men from this department have been assigned to this work and an equal number from the State.

The cost of pasteurizing milk in a properly designed and operated plant has been estimated to be \$0.00313 a gallon, and of cream \$0.00634 a gallon. At the same time it was estimated that the "holder" process, in which the milk is kept for 30 minutes at a temperature of 135° to 145°, is less expensive than the "flash" process, by which milk is raised for a moment only to a higher temperature.

By making use of their exhaust steam, creameries, it is calculated, may take 1 horsepower from their boiler load for every 400 pounds of milk pasteurized every hour.

## STATION PUBLICATIONS.

(Contribution from the States Relations Service.)

The station publications noted in this list are not distributed by the Department of Agriculture, but can usually be obtained by department workers, as far as the supply will permit, by applying to the stations issuing them. An address list of the stations will be furnished upon request by the States Relations Service. Copies of these publications can be consulted in the library of that service and also ordinarily can be borrowed from the Department Library.

### CROPPING SYSTEMS AND SOIL STUDIES.

- Local Fertilizer Experiments With Sweet Potatoes. By J. F. Dugger and J. T. Williamson. (Alabama College Station Bulletin 184, pp. 19-34.)
- Farm Manures. By J. C. Beavers. (Indiana Station Circular 49, pp. 20, figs. 3.)
- The Effect on a Crop of Clover of Liming the Soil. By F. W. Morse. Toxic Effect of Iron and Aluminum Salts on Clover Seedlings. By R. W. Ruprecht. (Massachusetts Station Bulletin 161, pp. 119-129, pl. 1.)
- Meadows and Pastures. By J. H. Voorhees. (New Jersey Stations Circular 43, pp. 3-7.)
- Soil Physics and Soil Moisture in Relation to First Year's Growth of Alfalfa. By L. R. McNeely and G. W. Kahle. (New Mexico Station Bulletin 93, pp. 42, figs. 18.)
- Ground Limestone for Sour Soils. By F. H. Hall. (New York State Station Bulletin 400, popular edition, pp. 2-8.)
- Rape Pasture for Pigs in Corn Field. Kaoliang for Pigs. By J. W. Wilson. (South Dakota Station Bulletin 157, pp. 131-143, figs. 5.)
- Soy Beans—An Important West Virginia Crop. By I. S. Cook and W. B. Kemp. (West Virginia Station Circular 20, pp. 19, figs. 4.)

### ANIMAL INDUSTRY.

- Cattle Feeding.—X, Winter Steer Feeding, 1913-14. By J. H. Skinner and F. G. King. (Indiana Station Bulletin 178, pp. 343-384.)
- Sheep Feeding.—IV, Fattening Western Lambs, 1913-14. By J. H. Skinner and F. G. King. (Indiana Station Bulletin 179, pp. 387-404, fig. 1.)
- Raising Calves on Skim Milk. By O. E. Reed. (Kansas Station Circular 48, pp. 11, figs. 4.)
- Corn Silage and Alfalfa Hay for Beef Production. By R. K. Bliss and C. B. Lee. (Nebraska Station Bulletin 151, pp. 5-43, figs. 16.)
- Rations for Growing and Fattening Roasters and Capons. By W. J. Buss. (Ohio Station Bulletin 284, pp. 155-172, figs. 2.)
- Sex Ratios in Pigeons, Together with Observations on the Laying, Incubation and Hatching of the Eggs. By L. J. Cole and W. F. Kirkpatrick. (Rhode Island Station Bulletin 162, pp. 463-512, figs. 5.)

### DAIRYING.

- How to Produce Cream that Makes Good Butter. By O. F. Hunziker and G. L. Ogle. (Indiana Station Circular 51, pp. 8, figs. 7.)
- Variations in the Tests for Fat in Cream and Skimmed Milk. By E. S. Guthrie and G. C. Supplee. (New York Cornell Station Bulletin 390, pp. 271-289, figs. 9.)

### FRUITS.

- The Avocado in California. By I. J. Condit and M. E. Jaffa. (California Station Bulletin 254, pp. 381-402, figs. 9.)
- Mangoes in Florida. By P. H. Rolfs. (Florida Station Bulletin 127, pp. 105-138, figs. 19.)
- Pruning. By F. S. Merrill. (Kansas Station Circular 49, pp. 14, figs. 9.)
- Progress in Plant Breeding. By N. E. Hansen. (South Dakota Station Bulletin 159, pp. 179-192, figs. 7.)

Farm Apple Storage. By M. B. Cummings and P. M. Lombard. (Vermont Station Bulletin 180, pp. 99-136, pls. 4, figs. 6.)

### INSECTS AND ANIMAL PARASITES.

- Fly Baits. By J. E. Buck. (Alabama College Station Circular 32, pp. 34-39, fig. 1.)
- The Control of Citrus Insects. By H. J. Quayle. (California Station Circular 129, pp. 35, figs. 18.)
- Potato Insects. By R. L. Webster. (Iowa Station Bulletin 155, pp. 359-420, figs. 43.)
- The Hessian Fly. By T. J. Headlee. (New Jersey Stations Circular 46, pp. 3-8.)
- Some External Parasites of Poultry with Special Reference to Mallophaga, with Directions for their Control. By G. W. Herrick. (New York Cornell Station Bulletin 359, pp. 233-268, figs. 22.)
- Controlling Plant Lice in Apple Orchards. By F. H. Hall. (New York State Station Bulletin 402, popular edition, pp. 3-7, figs. 2.)
- Control of the Colorado Potato Beetle (*Leptinotarsa decemlineata*). By L. B. Smith. (Virginia Truck Station Bulletin 14, pp. 315-333, figs. 5.)

### PLANT DISEASES.

- Orchard Spraying. By D. E. Lewis. (Kansas Station Bulletin 203, pp. 5-44, figs. 15.)
- Common Diseases of Apples, Pears, and Quinces. By M. T. Cook. (New Jersey Stations Circular 44, pp. 2-19, figs. 18.)
- Common Diseases of the Peach, Plum, and Cherry. By M. T. Cook. (New Jersey Stations Circular 45, pp. 2-16, figs. 10.)
- Some Important Leaf Diseases of Nursery Stock. By V. B. Stewart. (New York Cornell Station Bulletin 358, pp. 171-226, figs. 29.)
- Apple Cankers and Their Control. By L. R. Hesler. (New York Cornell Station Circular 28, pp. 17-23, figs. 16.)
- Potato-Spraying Experiments at Rush in 1914. By F. C. Stewart. (New York State Station Bulletin 405, pp. 335-339.)

### INSPECTION AND METEOROLOGY.

- The Creamery and Testers' License Law. By O. F. Hunziker and G. L. Ogle. (Indiana Station Circular 50, pp. 36, pl. 1, figs. 9.)
- Meteorological Observations at the Massachusetts Agricultural Experiment Station. By J. E. Ostrander and R. E. McLain. (Massachusetts Station Meteorological Bulletin 317, pp. 4.)
- Inspection of Feeding Stuffs. By A. W. Clark. (New York State Station Bulletin 404, pp. 221-334.)
- Special Bulletin Food Department. (North Dakota Station Special Food Bulletin 3 (1915), No 17, pp. 289-304.)
- Analyses of Feeding Stuffs. By P. H. Wessels et al. (Rhode Island Station Inspection Bulletin, 1915, May, pp. 2-16.)
- How to Comply with the Law Regulating the Sale of Concentrated Feed Stuffs in Texas. By B. Youngblood. (Texas Station Circular 6, n. ser., pl. 14.)

### MISCELLANEOUS.

- When, What, and How to Can and Preserve Fruits and Vegetables in the Home. By G. W. Carver. (Alabama Tuskegee Station Bulletin 27, pp. 3-8.)
- An Experimental Study of the Rest-Period in Plants. By W. L. Howard. (Missouri College Station Research Bulletin 15, pp. 3-25, figs. 8.)
- Physiological Studies of *Bacillus radiclecola* of Canada Field Pea. By M. J. Prucha. (New York Cornell Station Memoir 5, pp. 9-83.)
- Mushrooms—Edible and Poisonous. By D. C. Babcock. (Ohio Station Circular 153, pp. 87-92, figs. 3.)
- Proso and Kaoliang as Table Foods. By N. E. Hansen and Nola K. Fromme. (South Dakota Station Bulletin 158, pp. 147-176, figs. 2.)
- Flora of Vermont. By G. P. Burns et al. (Vermont Station Bulletin 187, pp. 139-258.)
- Forest Planting in Vermont as an Investment. By A. F. Hawes. (Vermont Station Bulletin 188, pp. 261-294, pls. 4.)
- The Social Anatomy of an Agricultural Community. By C. J. Galpin. (Wisconsin Station Research Bulletin 34, p. 34, pl. 1, figs. 7.)



# SELECTED LIST OF ACCESSIONS TO DEPARTMENT LIBRARY.

June, 1915.

## AGRICULTURE.

- Alpha Zeta. The Quarterly. v. 13, no. 4. 89 p. [Harrisburg, Pa.] 1915. Describes the work of the U. S. Dept. of agriculture.
- Andrews, E. A., & Tunstall, A. C. Notes on the spraying of tea. 75 p. Calcutta, 1915. (Indian tea association. [Publications] 1915, no. 1)
- Anstead, R. D. Coffee, its cultivation and manuring in South India. 48 p. Bangalore, 1915. (Mysore—Dept. of agriculture. Bulletin. General series, no. 6)
- Capoduro, M. L'agriculture dans les Basses-Alpes. 120 p. Paris, 1914.
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A model convict camp is to be established in Berkeley County, W. Va., through a co-operative arrangement between the State road engineer, the county board of Berkeley County, and the Office of Public Roads and Rural Engineering. A force of between 40 and 50 convicts will be employed under the honor system to construct the road. The county will provide the necessary expenses for the operation of the camp. The department contributes about \$10,000 to the cost of the road.